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SHAKESPEARE'S INDUSTRY.

THROUGHOUT the length and breadth of the United States, in almost every newspaper and magazine, attention has been directed, with approval or the reverse, to the recently renewed attacks which a Mr. Ignatius Donnelly has made upon the fame and name of Shakespeare. The tone of many of the comments in Mr. Donnelly's imagined discovery of a cypher in the Folio of 1623, the interpretation of which shows Bacon to have been the real author of the Shakespeare plays, recalls the exclamation of certain ardent Scotsmen after the first performance of Home's "Douglas," "Whaur's Wullie Shakespeare noo?" But it is pleasant to notice that all in America whose opinion can be of any weight consider gentle Will to be where he ever was—enshrined in the hearts of men of English blood, not only as the greatest dramatic poet the world has known, but as one whose works reveal him (almost despite himself, true dramatist that he was) as a man of most lovable nature. The only fault one can find with writers of the latter sort is that they should attach any importance to Mr. Donnelly's nonsensical cypher, the published readings from which are as much like the English of Francis Bacon as the eloquence of a stump orator in the Far West is like the language of a Walter Raleigh. "I was in the greatest fear that they would say that I was," &c., &c., is the beginning of the first sentence attributed by Mr. Donnelly to Francis Bacon! He might as reasonably have attributed it to Roger Bacon or to a Saxon chronicler.

But my purpose is not to follow American writers in discussing either favourably or unfavourably the Baconian theory of Shakespeare's plays—a theory born dead; and still less in commenting on the Donnelly development of the theory, a development whose condition is beyond that of the death stage. I wish to touch on what is undoubtedly the great marvel and mystery of Shakespeare's career, a marvel so great that one almost wonders some mythic developments have not by this time come to surround the story of the poet's life; and I propose to consider as serving to diminish the marvel, a piece of evidence in regard to Shakespeare's career, which, though well known, has never, so far as I know, been read as I am about to read it now.

The great difficulty about Shakespeare has always been that a man with opportunities so imperfect, with a training presumably so insufficient, should be found, within a few years of his leaving Stratford, already high in repute among playwrights, when as yet no poem of his had been published. If we can get over this we can readily understand Shakespeare's rapid advance as something more than a playwright; because we should thus have evidence of dramatic potency (so to describe the special faculty which Shakespeare, beyond all other men, possessed) sufficient to account even for that amazing progress which soon set Shakespeare as far in advance of Marlowe as Marlowe was in advance of Lilly. Deal with Shakespeare as we may, he must remain ever a marvel among men; but if we were to accept the opinion of Emerson that Shakespeare was a miracle, we should lose somewhat of our interest in him as a man. It will suffice that we should regard him as towering high above all other dramatic poets, even as Gauris-Ankar towers high above Kinchin-Gunga, Dhawala Giri, and the lofty peaks of the Knot of Tsunling: we need not regard his greatness as miraculous any more than we need imagine that the loftiest peak of the Himálayas was raised to its present height by the efforts of an imprisoned Titan.

After all, the chief difficulty, if we consider the matter aright, has been in the assumed wildness of Shakespeare's youth, and the inference that what he did he achieved with little effort. That "infinite capacity for taking pains," which is characteristic of genius, has been supposed wanting in Shakespeare's case; and men wonder not only or chiefly that he should have attained the poetic power he presently displayed, but that he should display correct if not very profound knowledge in a number of subjects—law, medicine, surgery, physics, horticulture, history, languages, and so forth—about which he could have learned little in his boyhood and youth.

But we have evidence of an especially satisfactory kind, since it comes from an avowed enemy, to show that Shakespeare must have had just those qualities which, with his innate genius, were alone needed for the acquirement of the knowledge he possessed and the judgment he displayed very soon after his career as actor and dramatist had begun. We learn enough to show that so far from being idle and dissolute, as Donnelly and other detractors pretend, he must have been patient and industrious to a remarkable degree.

The evidence I refer to is that which has been often quoted against Shakespeare—the words in which the dying dramatist Greene warns his fellow-actors and playwrights against the rising poet, whose future fame he evidently foresaw and envied:—"There is an upstart crow," he tells certain of his fellow-playwrights—probably Marlowe, Peele, and Nash—"beautified with our feathers, that with his *tyger's heart wrapt in a player's hide*, supposes he is as well able to bumbast out a blanke verse as the best of you; and, being an absolute *Johannes Factotum*, is in his own conceit the only Shake-scene in a country." How this should have come to be regarded as injurious to Shakespeare's fame, and how the real though unconscious tribute to his merit involved in it should have been overlooked, I find it difficult to understand. But certain it is that while this passage has been eagerly quoted by detractors, the lovers of Shakespeare have regarded it as involving an attack from which he needs to be defended.

Now, it is obvious to begin with that Greene was full of anger and bitterness when he wrote his "Groat's worth of Wit bought with a Million of Repentance." A dissolute life, to use no harsher expression (where, however, a much harsher expression might be used, when we consider his treatment of his wife), had brought him to a wretched death, on a borrowed bed, where still his thoughts turned towards the poetic fame he had sought, insomuch that his last injunction to the shoemaker's wife, on whose bed he lay dying, was that she would crown his corpse with bays! He had earned considerable fame as a dramatist; indeed, despite his bombast and affectation, his plays indicate a brilliant fancy and marked dramatic power. He probably thought himself the equal of Marlowe, though he was far from that, and therefore superior to all others. The rising fame of

Shakespeare would naturally be a sore point with him, especially when his mind, already diseased, was weakened by the approach of death. I suspect there was also special cause of anger against Shakespeare, who at this time (1592) had probably already worked in collaboration with Marlowe over plays of Greene's own; if so, Shakespeare must have been led to point out defects where Greene could see only beauties. Shakespeare's real offence probably was, not that he thought himself able to "bumbast out a blanke verse," but that he had taken out the bombast from blank verse of Greene's. To a man of Greene's nature that would have been an unpardonable offence.

Yet Greene could find nothing worse to say of Shakespeare, after calling him "an upstart crow"—a mere ebullition of temper—than that he was only the general business man, the man of all work of the theatre, and not the dramatist he thought himself. Think how much genuine modesty it implies on Shakespeare's part, that, with the power he must have recognised within himself ere this, he should only have shown so much confidence as to suggest even to Greene's jealous mind that he thought he might equal Greene or Marlowe as a playwright! The idea that Greene meant to suggest unfair plagiarism on Shakespeare's part, by the reference to a line in the "Third Part of Henry VI."—

> O, tyger's heart, wrapt in a woman's hide!

(certainly borrowed, bad as it was, from the "True Tragedie of Richard, Duke of York") will not be entertained by those who understand under what conditions actors of sufficient talent worked upon plays which were the property of their theatre. While it is certain that many passages of the "Third Part of Henry VI." were written by Shakespeare, it is probable that he did not write a line of the old work from which this play was recast. Probably a third only of the modern play is his, nearly another third altered by him and Marlowe, and rather more than a third left unchanged. The line quoted, with slight change, by Greene, is one of those belonging to the old play, and is only used as being abusive, not to insinuate that Shakespeare had stolen what was known by every actor in the company to be one of more than a thousand lines with which Shakespeare had nothing to do. More likely than not, Shakespeare had wished the line struck out, and had been overruled by Greene and Marlowe: certainly Shakespeare would not have been pleased with the use of so coarse a word as "hide" for a woman's skin.

But while Greene's abuse implies absolutely no offence on Shakespeare's part, except a confidence in himself which his subsequent career splendidly justified, Greene reveals the true secret (apart from surpassing genius) of Shakespeare's wonderful success. Shakespeare was "an absolute *Johannes Factotum*." Whatever his hand found to do he did it with his might. Greene had trusted in genius—having, indeed, only talent—and had failed. Shakespeare, full of genius, had also that infinite capacity for taking pains without which even the highest genius can avail little. We need no other explanation of Shakespeare's career. Possessing the profoundest poetic and dramatic insight ever given to man, and with it abundant energy and patience, he could not fail to become the Shakespeare known to the world.

If we may thank Greene for his indirect evidence (where we possess so little evidence of any sort) respecting Shakespeare, we may thank him still more for the direct evidence which his attack elicited, within three months, from Chettle, his executor and publisher. "I am as sory," says Chettle, apologising for Greene's attack, "as if the originall fault had been my fault; because myself have seen his demeanor no lesse civill, than he exelent in the qualitie he professes; besides, divers of worship have reported his uprightnes of dealing, which argues his honesty, and his facetious grace in writting, that aprooves his art."

In studying the life and character of Shakespeare as revealed in his writings, it is my purpose to take his plays in the order in which, so far as we can judge, they were produced. And since in the very beginning of his dramatic work he was engaged in adapting and working up old material, and even in that work was not alone—holding, indeed, at first a subordinate position—it is in such unsatisfactory plays as "Titus Andronicus" and all three parts of "Henry VI." that we must first seek for such evidence about his own life and his own character as Shakespeare may unconsciously have introduced into his plays. Those old imperfect plays contain less direct evidence than later works; yet I think I shall be able to show that we can learn from them somewhat respecting Shakespeare's patient industry, a good deal respecting his modesty, and a little respecting that self-reliance which later led him, with just reason, to prefer his own judgment in dramatic points even to that of men whom at first he had regarded as his teachers.

EVOLUTION OF LANGUAGE.

By ADA S. BALLIN.

THERE is a very large number of words, such as I described in my last,* which have originated in the voluntary repetition of the natural vocal expressions of sensation and emotion. From these I will select a few more which will readily suggest others to the reader's mind.

The cry forced from us by a sharp pain is *ah* or *ach*, whence our *ache*, Greek and Latin *ak*, in the sense of sharp, *acutus*, our acute, of pain, &c., and possibly *agony*. The Maori *áks áks* is to split. To this, Key traces also the common Greek suffix *ax* (ακ), which, according to Pott, has the meaning of "little." *Ugh* is a natural expression of cold and horror, and from it Wedgwood derives the Scotch verb to *uj* (houge), to feel abhorrence, and our adjectives *ugly* and *ugsome*, also *huge*:—

> What his kind frightened mother *ugs*
> Is music to the sodger's lugs—Jamieson, *Sc. Dict.*

To take another example, we find the deaf and dumb make the sound *m'm* or *m'n*, which they use with a shake of the head, to mean "unable to speak," a sound produced by breathing through closed lips. We find it again in the expression, "Mum's the word;" in Quiché *memer*, to become *mute*; in our *mumble*; in Tahitian *mamu*, to be silent. The sound of closing the lips is also very naturally used to express food or the taking of food. One of Darwin's babies, when a year old, invented the word *mum*, meaning food, and used it imperatively in the sense of "Give me food!" Taine's little girl, imitating the sound of snapping up a morsel of food, in her fourteenth month, produced the word *hamm*, which she used to communicate the fact that she was hungry or thirsty. This word, being repeated by her parents in a milder form, lost its original forcible pronunciation, and was modified to *am*, a good example of the manner in which imitative words may become conventional. In the Negro-English of Surinam *njam* (*nyam*) is "to eat," *njam-njam* food. In the African Susu dialect *nimnim* is "to taste;" Zulu *nembita* to smack the lips after tasting, hence to be

* KNOWLEDGE, vol. x. p. 129.

tasty, and, figuratively, pleasant to the mind. The Chinese child-word for eating is *nam*, English *nim*. The Swedish dictionary recognises *namnam* as a word for tit-bit, and I well remember in the first pantomime I ever saw—"Puss in Boots"—the Puss, which had stolen some honey, making use of the expression :—

Num-num, isn't it nice,
A flavour far superior to mice ?

an expression which, by the by, found its way into my family on that occasion, and has survived with us ever since. A little three-year-old friend of mine calls everything that she considers nice *nummyna*. Such imitative words are readily formed by children, and sometimes survive by being taken up and repeated by the elders of the family; but they generally disappear when the ordinary word applied to the object indicated is taught to the little one.

As regards the second class, that of words derived by imitation of sounds produced by animals other than man, a great deal has been said by all writers on language, so much so indeed that a favourite theory of the origin of language has been nicknamed by Professor Max Müller the "Bow-wow theory." A very few instances will therefore suffice for my present purpose.

In English, animals are rarely named from their sounds, except in the language of the nursery, as *mou*, cow ; *baa*, lamb, sheep ; *bow-wow*, dog ; and similar instances might be cited from other European languages. To show how general this tendency is we may observe that the natives of the north-east coast of Papua call a dog *bow-wow* ; in Australian *twonk* is frog ; in Coptic *leiō*, ass ; in Chinese *maou*, cat. Corresponding with the English *bumble-bee* we find Sanskrit *bambharâti*, a fly ; Greek *bombulos*, Australian *bumberoo*, from the buzzing sound produced by the motion of the creature's wings through the air. Corresponding with our *cock*, nursery *cockadoodeldoo*, we find in the Spanish nursery language *quiquiriqui*, Yoruba *koklo*, Ibo *okoko*, Zulu *kuku*, Finnish *kukku*, Sanskrit *kukkuha*. M. Taine's little girl used the word *koko* for chicken (in French nursery language this is a general word for bird), *oua-oua* for dog, and *mia* for cat, imitating as nearly as possible the utterances of the creatures themselves. When the cat was introduced into Egypt from Nubia, the Egyptians called it *miau*.

The third class mentioned in my last article, that of words derived from imitation of sounds produced by motions of inanimate things, is obviously a very large one, far exceeding the other two classes in extent. Thus we have the *rush* of air, the *swish* of water against obstacles, the *roar* of waves, the *sigh* of the breeze, the *murmur* of the sea at rest, the *plash* of its wavelets on the pebbles of the beach, and so on. To come to less poetical examples, we have the *crash* of broken glass, the *slap* of flesh against flesh, the *bang* of a door or explosion, the *ping* of a bullet, the *snap* of fingers or a clasp, the *tingling* of an ear which has been boxed (a subjective sound, the imitation of which has given a name to the *tingling* of any part of the body, other than the ear, that has been struck), the *pop* of a *pop*-corn or *pop*-gun—a word which by similarity, based on the idea of quick motion, has been applied to the *popping* of anything into one's pocket or elsewhere; and by similarity, based on the idea of explosive force, to the *popping* of a certain momentous question. Again, we have the *blazing* of a fire, and "Go to blazes!" is a polite intimation that the person addressed may retire to warmer regions. Then we have "the smasher-and-banger" school of musicians. To *kick* is a seemingly imitative word, as also to *grumble*, *growl*, *moan*, *groan* ; to *dot*, as with a pencil on paper and *jot* down notes ; to *brush*, *wash*, *sweep*, *rub*, *clap* the hands, *loll* out the tongue—a word applied also to *lolling* on a sofa, for example, the idea of limpness giving rise to this transference. From the imitation of the sound of rapid revolution in air we have the word *whirr*, whence German *wirren*, to twist ; French *virer*, English *veer*, as a ship or weather-cock : *whirl*, *whorl*, *warp*, *worm*, in the sense of *wriggler*, whence, also, the derivative *worm* of a screw or helix. The sound is heard also in *writhe*, *wreath*, *wrench*, *wrest*, *wrist*, *wring*, *wrap*, *wry* ; Latin, *varus* (with crooked legs), *varices* ; English, *varicose* veins, *vermis*, *verminari*, to breed worms or writhe in pain—the Latin sound, which we represent by *v*, being more properly a *w*. Our words *vermilion*, *carmine*, and *crimson*, which now express pure ideas of sight, are due to a word which appears in Latin as *vermis*, in Sanskrit as *krimi*, a worm, the colour being anciently obtained from a shell-fish, which, when removed from the shell, resembles a worm in appearance. To take another example, the sound of *scratching* may be represented by *kar* or *char* (Greek χ) ; in Latin, *car*-ĕre or *carpĕre* lanam is to *card* wool ; *carduus* the teasel, German *krämpal*. The participle *castus* from this verb, *car*-ĕre, in the sense of to purify, gives rises to our *chaste*, an abstract word, which at first sight certainly does not appear to have an imitative origin. In Greek, from the same sound come the words *charasso*, *charakter*, *skariphuō*—our *scar*, *scrape*, *scarify*, *scratch* ; Norse *scratha* ; German *kratzen* ; French *gratter*, whence our *grate*, and the Greek *graphō*, to write (really to scratch with a stylus) ; Latin *scrib*-ere ; German *graben* ; Dutch *krabelin* ; and English *scribble* ; with a host of other derivatives, many of which have by phonetic change lost all apparent sign of their origin. Endless examples of this kind might be adduced both from ancient and modern languages, and the process of making words by imitation of natural sounds is still adopted.

New words imitative of sounds are coined every day among ourselves. A curious instance of this struck me some time ago, and I noted it down. Mr. R. J. Shepherd, writing to the *Lancet* (December 12, 1884) the description of an operation for strangulated hernia, said : "The stricture was at the neck and yielded to the edge of the knife with an audible *snick*."* The italics are my own. In "Numa Roumestan" M. Daudet depicts an old French lady who is somewhat original in her speech, and refers for example to "Cent mille francs en bon argent *tin-tin*," thus illustrating the ring of the true metal, and the fact of the money being paid cash down. She also calls a certain musician "Ce joueur de *tutu-panpan*," upon which Daudet remarks, "Ce 'tutu-panpan' rendait si bien le double instrument, fifre et tambour, que Roumestan se mit à rire" (p. 65). The word *tambour* is itself imitative of the sound produced by the striking of parchment or some similar membrane ; it is also seen in our tambourine, *drum*. The sound of bleating is also expressed by the Eastern *tom-tom*, Javan *tumbuk*, Coptic *tinno*, to pound in a mortar, Malay *timpa tampa*, to beat out, hammer, forge ; Chinook jargon *tum-tum*, the heart, *tum-wâta*, waterfall. The Gallas of East Africa say, "*tum-tum bufa-lufti*," the workman blows the bellows, a phrase which would be similarly rendered by an English child as : "The *tum-tum* (or man that hammers) puffs the puffer." To *smite* or *strike* is in Sanskrit *tup*, *tubh*, Greek *tup*, *tump*, whence *tympanum*, a drum. The Gallas call a box on the ear *tub-djeda* (to say *tub*), while *tuma* with them means to beat, and *tumtu*, as I have said, a workman. Our word to *patter* is evidently imitative, French *pattatra*. In Australian, *badbadin* equals our *pitpatting*. The old word *patterero*, an old-fashioned

* There is an obsolete English word *snick*, meaning a small cut or notch, the origin of which is suggested by the above. It is not at all likely that Mr. Shepherd had it in his mind, however.

cannon for throwing grape-shot, is apparently imitative in sound, and its form was probably influenced by imitation, but the real derivation was *pedrero*, Spanish *piedra*, Fr. *pierre*, a stone. Our word to murmur is clearly imitative, and with it may be compared the Tamil *muru-muru*.

The origin of such words as *whisper*, *listen*, Ger. *flüstern*, *hush*, was probably imitative. *Silence!* is a command expressed among the Sioux by *hush-sh!* among the Veddahs of Ceylon by *iss!* and in Japan by a hiss, with which may be compared the Gr. *sizô*, to hush, command silence. As Wedgwood suggests, the savage watching for foe or prey would hear, or fancy he heard, a *rustling* among the leaves of the thicket or long grass, and in order to attract the attention of his companion or companions would softly imitate the sound, and thus produce such exclamations as hush! whist! st! &c., which would soon take their place in speech, and give rise to derivatives, becoming at the same time conventionalised in pronunciation.

Dr. Comrie says* that the natives of the north-east coast of Papua, when shown an iron axe, named it *din-din*, from the sound which it produced. When I was a little girl I used to call hammering "dodding," and I always believed that the old carpenter who used to work at the house, whose name was Dodd, was so called because he "dodded."

The spirit of imitation, besides giving birth to language, exercises a great influence upon the word after it has come into being.

When words are reduplicated or lengthened out in order to express degrees of comparison, the representation of thought is practically pictorial. Thus in French *beaucoup* is much, *beaucoup-beaucoup* very much, and the same mode of expression is common to the most widely different races. Among the Dyaks *kwai* is strange, *kwai-kwai* very strange; *ku-lyang* is to think, *ku-lyang-ku-lyang* to think deeply. In Madagascar *ratchi* is bad, *râtchi* very bad. Among the Watchandi of Australia *jir-rie* means already or past, *jir-rie-jir-rie*, a long time ago, and with much lengthening of the first syllable, *jie-r-rie-jirrie* an immense time ago. A Brazilian tribe has the word *ouatou* for stream, which becomes *ouatou-ou-ou-ou* for sea. The Aponegicrans for "six" use a word *itawuna*, and for "seven" *itawuūna*=a long six.

A child relation of Wedgwood's used the word "baby" as a diminutival prefix. Baby Thomas was the smaller of two men-servants of that name. To express further diminution, he narrowed the sound to *beebee*, and very small objects became *beebee-beebee* things. This word is probably connected with *wee*, and a baby friend of mine is always called *Wee-Wee*. Reduplication seems naturally to convey the idea of repetition, continuance, or an increased degree of the state indicated, *e.g. tiny*=small, *tiny tiny*= very small.

In Maori *puka* is to pant, *puka-puka* the lungs; *muka* flax; *muka-muka* to wipe, rub, for which flax is employed; *mura* to flame, *muramura* a flame. In Malay *ayun* is to rock, and *ayunayunan* a cradle. In Africa the Wolof dialect has *sopa* to love, *sopsopa* to love constantly, and Mpongwe has *kendu* to walk, and *kendagenda* to walk about for amusement. In Dayak *kaká-kaka* means to continue laughing loudly."

In Chinese, frequentatives or the repetition and continuation of an action are expressed by repeating the primitive syllable, as *mô-mô*=to go on rubbing; *hŏ-hŏ*=to keep on drinking; *t'iaú-t'iaú*=to jump about. The repetition, however, sometimes serves to intensify the meaning of the primitive. It gives the notion of "a good many," "all," "every," to a single, as *jîn*, man, *jîn-jîn*, everybody, all men or most men; *jĭ*, day, *jĭ-jĭ*, daily; *chĕ-chĕ sāng-pîng*, each (animal) is sick; *shĭ-shĭ k'ō-liên*, truly to be pitied; *tī tsüĭ-hiūm-hiūm*, completely intoxicated.

Similarly in colloquial speech, we say, "He went on write, write, write;" "I like it very, very much;" "Oh, go on, talk, talk, talk," and so on.

In the early stages of language there seems to have generally prevailed a love of reduplication for the mere pleasure of repetition, as well as for the sake of greater clearness and pictorial effect. In South America there is a river *Bio-bio*, a rodent *tuco-tuco*, and so on; and the Maori dictionary is full of words of such formation as *mati-mati*, toe; *êmi-émi*, tree; *áki-áki*, to urge; and *áti-áti*, to drive away. In Hebrew the superlative is formed by repetition of the adjective. In Breton from *mâd* comes *mâd-mâd*, best; from *fall*, bad, *fall-fall*, worst. The French have *bon-bons*, goodies. Reduplication seems, therefore, to intensify an action or quality; and duration of time, as well as largeness and smallness of dimension (intensification), is also expressed by the lengthening out of vowels.

With regard to the long vowel of the present tenses of Latin and Greek verbs, in place of the short vowels of the stems, and the strengthening of the final consonant, it has been suggested that its origin is really imitative, denoting the duration of the act, as when we say, "He came *creeeping* along," or "He *draawls* out his words." Thus, *phaīno*, *scrībo*, *dīco*. While, on the other hand, the short penult of *etupon*, *elabon*, *elathon*, &c., agrees with the momentary nature of the act.†

In the many words and roots which I have mentioned, and in thousands of others which I might record if space permitted, the imitative or pictorial origin is clear; and as I have shown‡ that the trace of the origin of words is easily and most frequently obliterated by the growth and wear and tear of language, the inference is patent that imitation must have played a most important part, if not *the* most important part in the first development of speech.

* "Journal of the Anthrop. Inst.," vi. 2 (Oct. 1879).

AMERICANISMS.

GOBBLER, for a turkey cock, is probably no more an Americanism than *Bow-wow* for a dog. Readers of "The Pioneers" will remember how the owner of the unlucky turkey to be shot at by Leatherstocking and the big Vermonter calls to his bird, "Poss up a gobbler." The expression belongs rather to nigger patois than to American English.

Go. A State is said to *go* Democratic, or to *go* Republican, when it votes for one or the other cause after being for a time doubtful, or on the other side.

GO BY, To. To stay; *not* to go by, as we understand the words in England. This peculiar usage belongs to the Southern States. The explanation is not so difficult as might be expected. Where in journeying a traveller has a choice of ways, as in the South is generally the case, a friend will say to him, "Go by my plantation and stay with me," meaning simply choose that way. Later such a request would be shortened into "Go by and stay with me." Southerners do well to get a convenient expression for such cases, seeing that they are of all men in the world the most hospitable and generous.

GO FOR, To. To go for any one, in the sense of attacking him, appears to be an expression of Southern origin, though now heard commonly enough all over the States.

† T. H. Key, "Language: its Origin and Development," 1874, p. 144.

‡ KNOWLEDGE, vol. ix., p. 85 *et seq.*; p. 141 *et seq.*

It may possibly have been suggested by those Southern duels in which the combatants were left free to seek for each other over a wide tract of country. For if a Southerner's generosity knows no limit, neither does his combativeness, when he considers it justifiably excited.

GO IT ALONE, To. In euchre a player may decide to play the hand alone, his partner turning down his cards (sometimes after giving the best card to the lone player, who then discards his worst). Success in such a case counts double, as also does failure. A player who thus decides to play alone, is said to "go it alone," and a similar expression is applied to one who decides to carry out any business operation on his own sole responsibility, and without help from others.

GO IT BLIND, To. At poker a player who bets on his hand before seeing it is said to "go it blind," and the usage is extended to any one who in any undertaking trusts blindly to chance.

GOLLY! Used *euphemistically* (says Bartlett!) for "God." Dogberry could hardly have beaten this; God forbid but God should go before such a villainous niggerism as Golly.

GONE CASE, for a person or event past hope is as much English as American: but

GONE COON, for one in hopeless case, is a good Western Americanism, simply because we have no racoons in the home country.

GONE GOOSE, GONE GANDER=Gone Coon: nor is "gone gosling" different in significance, save perhaps that it suggests a more youthful unfortunate.

GONER=gone goose, &c., &c. The "r" termination may be regarded as simply the usual Teutonic way of indicating personality. The Greeks and Latins preferred "s."

GOOD, for "well" is simply an Americanism in being a piece of bad grammar more commonly heard in America than in England. But the word "good" is also used in America in a way which must be regarded as essentially American. Thus, "Take that toddy; it will make you feel good," by no means signifies, as an Englishman might suppose, that imbibing the toddy will produce a virtuous feeling (though I have known men who have mistaken intoxication of one kind or another for saintliness); it means simply that after taking the toddy you will feel, or the toddy-maker hopes you will feel, jolly. This peculiar usage has proved a source of perplexity in some cases, and of amusement in others, to Englishmen passing their time in the States, whether on pleasure or instruction bent. A friend of mine tells how a proposition was once invitingly made to him which, to say the least, involved no virtuous self-abnegation, and he was urged to accept it by the plea that "it would make him feel *good*."

GOODIES. Mr. Bartlett is good enough to inform us that "goodies," for sweetmeats, is "provincial in Suffolk, England." I have yet to learn of any part of England where sweetmeats are not called "goodies."

GOOSE, SOUND ON THE. In the Southern States, in the old slavery times, to be sound on the goose, meant to be orthodox on the slavery question. As to the origin of the expression, this deponent, knowing nothing, says the same.

GOOSE HANGS HIGH, THE. All is serene. The origin of this expression is also lost in mystery.

GOPHER. Any mining or burrowing creature seems entitled to be called a "gopher" in the States. In the middle States the term is usually applied to a species of mole; elsewhere to a kind of squirrel; while in the South a gopher is a species of land-turtle which, in the low country, burrows in the ground.

GOSH. Used in a form of oath, which Mr. Bartlett insists on considering "euphemistic," insomuch that one is led to wonder what he understands by "euphemism." If "by Gosh!" is euphemistic to Mr. Bartlett's ears, what, one would like to know, would he regard as cacophonous?

GOTHAM. A name applied to New York by Washington Irving, and now constantly employed as a synonym for the American metropolis—so that

GOTHAMITES are New Yorkers.

GO THROUGH, To. After explaining that our English expression "to go the whole hog" is "a Western vulgarism caught up by some late English writers"—though Cowper long since gave the saying position—Mr. Bartlett is kind enough to tell us that whereas Americans say this train goes through to such and such a town, meaning—well, meaning—that it does go through, we benighted Britishers would imagine if we heard such an expression that a tunnel was referred to! It might perhaps surprise him to learn (only he is dead) that not only do we speak of a train going through to a place, without thinking of tunnels, but we have gone a step beyond, and devised the term "through train" for a train that does in this way go right on to some specified place.

GO THROUGH, To. In the sense of robbing any one of everything he possesses, the verb "to go through" would appear to be essentially American. The practice, however, is not so limited.

GO-TO-MEETING as an adjective, "Go-to-meeting hat," "go-to-meeting clothes," &c., is as much English as American.

GOUGE, To. To force an eye-ball out with the thumb. This practice, always, let us hope, confined to the most brutal of the lower orders, is now no longer in vogue in any part of the States. How much there is to choose between gouging and shooting, I do not know. As tokens of savagery they seem much on a par.

GRACIOUS! MY GRACIOUS! GRACIOUS SAKES! and GRACIOUS SAKES ALIVE! These exclamations are tolerably familiar in England; but Bartlett, because, like so many others, they have been migrations, deals with them as Americanisms of the purest water.

GRADE, To. To change the level of a road by excavating. I have not heard this word commonly used in this sense in England, though it is generally used by surveyors of roads and towns; in America the word is familiarly used, in this its proper sense.

GRAFT, To. To graft boots is to repair them by adding new leather outside the worn-out feet of the boots.

GRAVE-YARD. Mr. Bartlett says our English ears, accustomed to the word "churchyard," find "grave-yard" novel. This, at any rate, will strike most English folk as exceedingly novel.

GREASER. A term applied to Mexicans and other Spanish-Americans by the ruder sort in the Far West.

GREASY. The pronunciation of this word with the nonsonant or surd "s" seems to be peculiar to Americans.

GREENBACKS. Legal tender notes. These bills are for single dollars, two dollars, five dollars, ten dollars, twenty dollars, a hundred dollars, and higher amounts. Until about 1877 or '78 smaller coins had their paper representatives, down to ten cents, or fivepence in English money.

GRIG, To. To vex or irritate. In provincial English, *to grig* is to *nip* or pinch.

GRIPSACK. A hand-bag or satchel. Bartlett omits this word from his Americanisms; and I have seen it deliberately quoted as the *English* for what Americans call a satchel. But the word has never been used in this sense in England, except as a borrowed Americanism. That it is not an old-fashioned English word is shown by its introduction as the name of a trumpet in the language of the winged nation discovered by Peter Wilkins.

XUM

USE AND BEAUTY IN MATHEMATICS.

READERS of KNOWLEDGE are aware that I brought out in these pages, and have since republished, in a single small volume, a series of "Easy Lessons in the Differential Calculus," whose purpose was to encourage young mathematicians to study a method of calculation exceedingly useful in all departments of research to which mathematics can be applied. I did not raise the question whether the study of mathematics is chiefly to be valued for the help which mathematical methods may afford the student of science, or for its effect in training the mind to exact reasoning. I simply noted that numbers who have occasion to use mathematical methods are deterred from the study of the Differential and Integral Calculus by the supposition that it is not a mathematical system readily available in researches depending on calculation. For such students I wrote, proposing to show them that the Differential Calculus is as *directly* available as an aid in scientific researches and calculations as algebra or trigonometry. I think I succeeded in showing this. In fact that I did so I can safely infer from the large number of letters which reached me while my "Lessons" were in progress, communications to which, I may remark, the publication of the "Lessons" in a volume was chiefly due.

In the *Practical Teacher* an exceedingly unpractical and, to say the truth, somewhat pretentious critic reviews my little book as if it were intended to strike a blow at a much-loved doctrine of his own, that the learner's object in studying mathematics should be "chiefly disciplinary and only subsidiarily utilitarian" (like most critics of this type, our "practical teacher" writes fearful English) "to acquire that finesse of mental culture which this pursuit alone can impart, that nice logical perception of minute differences, the lack of which constitutes the most distinguishing characteristic of the ill-balanced mind, to demonstrate in short the falsity of Voltaire's foolish remark, 'J'ai toujours remarqué que la géométrie laisse l'esprit où elle l'a trouvé.'"

This critic, whose modesty is as conspicuous as his acumen, may possibly possess that nice logical perception of minute differences to which he refers; but he evidently possesses no perception of marked and noteworthy differences. If he did he would perceive (passing over the distinction between a remark of Voltaire's as to what he had observed and a mere opinion attributed to him) that there is all the difference in the world between encouraging the study of a particular branch of calculation because it is useful and deciding the question he raises—one way or another. The study of mathematics, apart from any idea of usefully employing mathematical methods, may have all the disciplinary and purifying effects the critic in the *Practical Teacher* attributes to it; the men who have chiefly been remarkable for developing the simply beautiful parts of mathematics may be among those whose nice logical perception of minute differences has chiefly charmed an admiring world: or, on the contrary, the study of mathematics of this particular kind (the charm of which, by the way, I probably know much more about than my critic) may tend to impair the mind's powers, and especially that mental common sense on which all real progress in knowledge depends; love for such study may be regarded rather as an appetite to be controlled (and often resisted) than as a taste to be encouraged. But whether one view or the other is right, I have not raised the question in my "Easy Lessons in the Differential Calculus"; and criticism turning on that question is entirely out of place so far as my little book is concerned.

If, however, the general question had been raised by me, my "practical teacher" might at least have put the question properly. It does not require that nice logical perception of minute differences which he lauds to perceive that the utilitarian side of mathematics is by no means limited to the paltry uses and classes of uses mentioned by him—the application of mathematics to problems in chance, to measuring the heights of mountains, to finding the way, and so forth. The utilitarian value of mathematics belongs to the whole domain of science, from the profoundest researches of astronomers, physicists, chemists, and biologists, to the humblest inquiries of every-day observers, from investigations of the infinitely great and the infinitely little to the study of the most familiar objects of every-day life. Newton and his followers, in dealing with the mutual attractions and perturbations of the heavenly bodies, had to use, and on occasion invent, mathematical methods ranging, be it observed, from the simplest to the most complex; but one cannot investigate the movements of a reeling top without mathematical methods, which also range from the simplest to the most complex. I imagine, by the way, that few, even among the mathematicians of Dreamland, can have been more tempted than Newton to luxuriate in mere mathematical reveries, such as have delighted the Hamiltons, Sylvesters, and Henrys: the loving touch with which he presents some quaint suggestion tending that way is at least as characteristic as the quick return which his common sense forces him to make to his actual subjects of research.

I know not that even though the mere moonshiners among mathematicians included the names deservedly held in most esteem among great thinkers, if they could be set above the Newtons, Laplaces, Lagranges, Herschels,* Leverriers, Adamses and the rest, it would greatly affect the question of the general value of mathematics as a means of mere mental discipline. For the number of those who will take any discipline of this sort, with or without any question of the usefulness of mathematics, is very small indeed. And though this may be a very trifling consideration to mere dreamers, it is one which every "practical teacher" ought to take seriously into account.

Having completely missed the whole purpose of my little work, a modest little manual enough, this unpractical "practical teacher" naturally fails to understand the details of my plan. For instance, "why Vanishing Fractions should be treated" he cannot imagine; "they do not swim into the student's ken a tenth as often as do Series, the whole question of which Mr. Proctor entirely ignores." Now, if my critic were only a student of the actual problems which arise in scientific research—in all departments, high and low alike—he would know that vanishing fractions are constantly appearing to perplex the student, and that the power of getting rid of their evanescent qualities, of making them represent something instead of nothing, which the Differential Calculus supplies, is an immense relief to the student. As for Series, no student ever finds occasion to deal with them until he has passed far beyond the stage where the methods of the Differential Calculus first begin to be needed. Series are pitchforked into elementary books on algebra and on trigonometry, and so "swim into the student's ken" quite early in his reading; but he does not, for all that, begin early to want them.

Then my reviewer pretends to be concerned because there is no mention of the Newtonian method for Maxima and Minima; but he omits to point out any reason why the method should be mentioned. My book was not intended

* William Herschel cannot be regarded as a mathematician of power, but John Herschel may justly be so regarded.

to show off knowledge on matters outside its subject. He says, indeed, that I refer to Newton's geometrical methods, but only to show how cumbersome they are. This, however, was not my object. I gave an example of Newton's geometrical method of dealing with a particular problem, and of an algebraical method of dealing with the same problem, and touched in passing on their cumbersome nature, in order to impress on the student the value of a method which deals with all such problems in a simple and easy way.

But my critic shows in an even more marked way his entire misapprehension of my very simple and modest little plan, when he asks why I did not deal with the measurement of arcs, since it is about as important as the measurement of areas. If he knew anything about the Calculus, he would be aware that so soon as the student enters on the determination of arcs, he finds himself confronted by problems of much greater difficulty than are involved in the determination of areas. Passing from the circle to the ellipse, which is next in simplicity of character, he finds that the formula for the determination of an elliptic arc does not admit of integration—being, in fact, the second of the three well-known "elliptic integrals" whose discussion by Legendre, Jacobi, and others has taxed the highest powers of differential analysis.

It will not be thought surprising that a critic who thus misunderstands the whole purpose of the book he criticises should imagine many things which have no existence, and misunderstand whatever can be misunderstood. He says my book is far from justifying "the boast" in the preface, and though the nearest approach to a boast is contained in the sentence, "I have striven in this little work to show at once how and why we want a method of calculation dealing with quantities which vary in value under varying conditions, and how such a method of calculation is to be used in practice." Again, I mention that I took up little of the Differential Calculus for my degree examination at Cambridge; and this clear-minded critic, so keenly conscious of the value of a nice logical perception of minute differences, assumes forthwith that I know no more of the Calculus now than I did then. I add that "what I have since learned about higher departments of mathematics" (for the Differential Calculus is quite elementary) "I have studied as occasion required—the only really effective way of studying mathematics," and my intensely perceptive critic finds the meaning of this simple statement beyond his utmost powers of conception.

When critics of this sort are coarsely rude, we must not blame them as we would others. But we must not, therefore, refrain from pointing out where they show coarseness or ill manners. My "practical teacher" is not content to criticise and misunderstand; he is not satisfied to blame as if his *ipse dixit* alone settled the matter: he adopts the method of the vituperative costermonger, who by his "That 's just like *you*, Bill," conveys at once the idea of blame and the suggestion of continued misconduct. The *Practical Teacher*, assuming the weekly charge for learning manners not wasted in the case of its writers, ought to know that to describe what a writer says as "eminently characteristic," with the evidently underlying idea that that is, of itself, to condemn it, is unworthy of a respectable publication, for it is altogether ungentlemanly. We look for such tricks at Billingsgate, not among decent members of society, or in sedate and well-mannered journals.

I admit, however, two characteristic peculiarities in my method of teaching, which persons who can recognise minute differences, but fail to see large ones, may recognise as signs of self-conceit. *Wherever* my own experience has taught me anything, whether it has taught me that I have been right, or that I have erred, I always say as much; and again, when an opinion is based on my own researches only, I point this out—a *Saturday Reviewer* or a too confident *Practical Teacher* says, "It *is* so and so," and as he does not mention himself, the average mind says, "He is not egotistical, he knows." I prefer to say, "It appears to me, so far as my own researches have extended, that the case is so and so," and because I mention myself the average mind says, "This man is an egotist." Which way of speaking is really the more modest, I leave the logical mind to decide.

AMERICAN UNION AND IRISH DISUNION.

I AM asked by a military correspondent if I can explain how it is that Americans, who fought so hard to maintain union in their own country, show such sympathy with the efforts of the Home Rule party.

I have never yet met with an American, properly so called, who sympathised in the slightest degree with the followers of Mr. Parnell. There *may* be some Americans who are misled by the clamour of the newspapers, nine-tenths of which owe the bulk of their political articles to Irish writers. And there are certainly many politicians who, in their public utterances, cater for the Irish among their constituents. But, from the multitudinous conversations I have had with Americans on the subject of England's difficulties with the Irish, I am convinced their strongest anti-British feeling in this matter amounts to nothing more than a lively sense of amusement that the old country seems likely to be hampered and worried into concessions and compromises precisely as the United States have been. That Irish section in America (unfortunately, far the largest) which corresponds with the present Home Rule party and the old Repealers, plays the same game of disturbance there which the followers of Parnell play here. They practically sell their support to the party which will pay most for it—and this alike in national politics, in State legislation, and in municipal matters. Irishmen of this type (most emphatically I do not mean the Irish *race*) seem incapable of higher or worthier policy. Unfortunately they too often get their way in America; just as in the old days of corrupt elections, men who were ready to sell their votes, were too often able to secure their price. The only proper remedy would be that sets of men guilty of this particular form of corruption should be, for a while, deprived of their votes, precisely as corrupt boroughs were in the old times.

The position of American newspapers in regard to the Irish question is well illustrated by an experience of my own. At the last election but one, when it seemed likely that the Home Rulers would be offered the bribe they had so long hankered for, I chanced, in the course of a letter to the *St. Joseph Herald* (written from England) to touch on the iniquity that concessions should be made for the sake of a party's votes, and apart (as former action showed) from any reference to the interests of the nation—asking in what this differed, except in scale, from common bribery and corruption. My letter appeared, only through a lucky or unlucky chance in all probability. But immediately the editor was called upon by indignant Irishmen, and told that unless he excluded thenceforth my name from his columns not an Irishman in Missouri would continue to subscribe. As my letters were practically a present to the paper, and only written at the editor's special request—the paper being of the nonpaying sort—I was no loser, but the reverse, when the editor carried out the wishes of his constituency. But the case illustrated strongly the subser-

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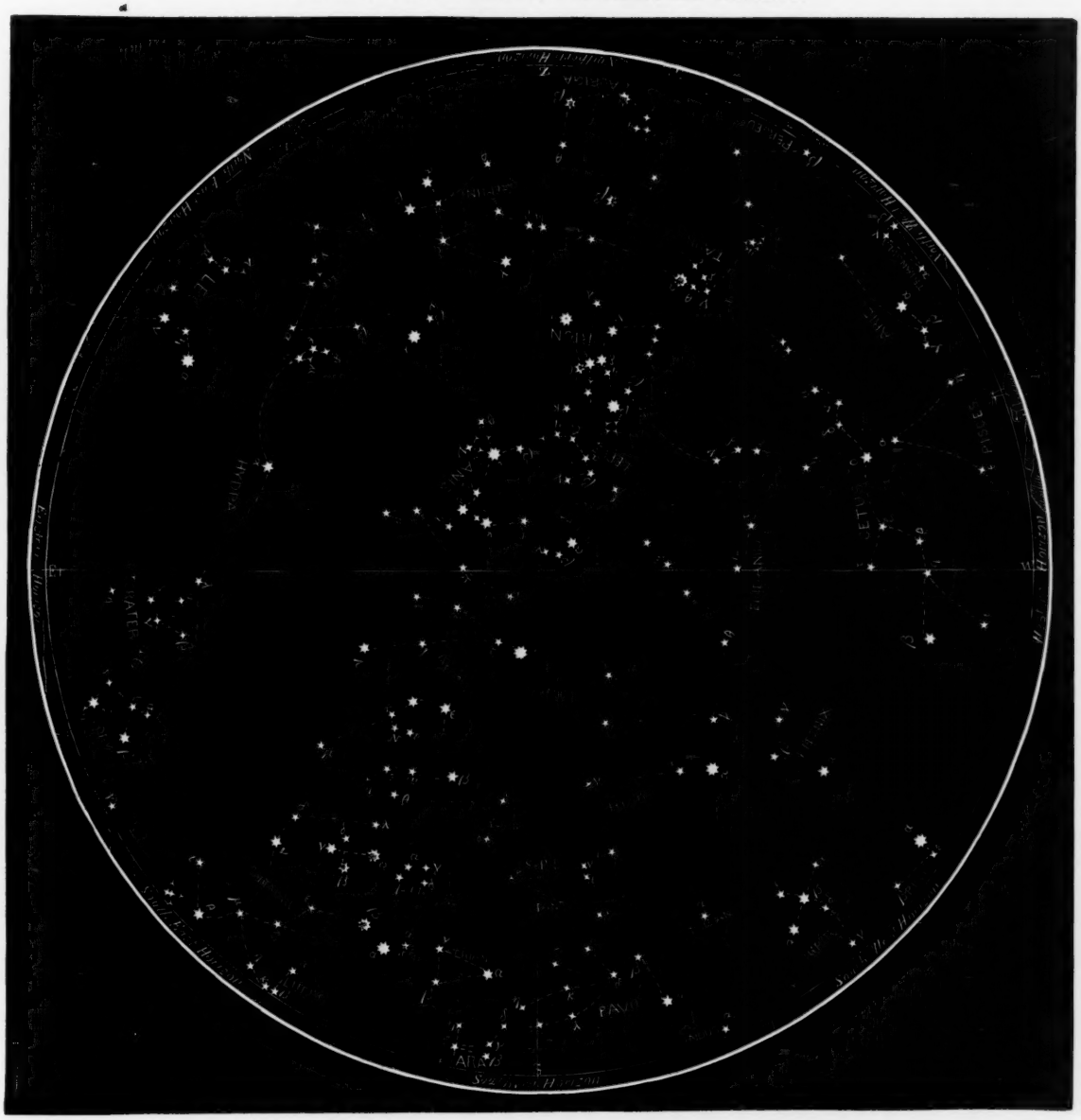
vience which many American editors are disposed to show to their Irish constituency.

I think that at heart Americans, North and South, value union chiefly because it keeps the nation great and strong, and safe from interference. It may be that, even as many in England foolishly imagined that the separation of North and South must be a gain to the old country, so some in America may imagine that were Ireland separated from England America's position would be improved. I have not, however, met with any Americans quite so foolish.

THE ONE-SCALE ATLAS.

THE SOUTHERN SKIES.

MAP XIV.—FOR NOVEMBER, DECEMBER, AND JANUARY.



THE NIGHT SKIES IN THE SOUTHERN HEMISPHERE (LAT. 46° TO 24° S.)
AND THE
SOUTHERN SKIES IN ENGLAND (UPPER HALF OF MAP ONLY) AT THE FOLLOWING TIMES:

At 1 o'clock, morning, Dec. 7.	At 11 o'clock, night, Jan. 7.	At 9 o'clock, night, Feb. 7.
„ 12.30 „ „ Dec. 14.	„ 10.30 „ „ Jan. 15.	„ 8.30 „ „ Feb. 14.
„ Midnight, Dec. 22.	„ 10 „ „ Jan. 23.	„ 8 „ „ Feb. 22.
„ 11.30 o'clock, night, Dec. 30.	„ 9.30 „ „ Jan. 30.	„ 7.30 „ „ Mar. 1.

STAR MAGNITUDES.

First .... ✸ Second .... ✱ Third .... ★ Fourth .... + Fifth .... ▲

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IS THERE ANY SCIENCE IN WHIST?

WE have received the following exhilarating letter from a correspondent who evidently does not appreciate "Our Whist Column":—

Exactitude being the chief corner-stone of science, ought the word "scientific" to be applied to a game, of which a haphazard groping in the dark is a chief characteristic? This is a question that recurs to me each month after a perusal of the Whist articles in KNOWLEDGE. Meanwhile I wonder how long there will be persons who entertain the belief that there is some high level of this happy-go-lucky game to which they attain, whilst they look down with contempt on what they style "Home Whist."

Whist, indeed, is a game of such complexity, the whole thing being worked, too, so much in the dark, that the "superior" player never discovers that he is living under a delusion; and, if he cannot show by final results that his play is more successful than the commonplace play of Mr. Humblemind [but Mr. Bumblepuppy never has a humble mind] "he falls back on his *bad luck* for an explanation."

But is it possible that the human mind can go on deceiving itself in this way? Certainly it may; for is not the great whist player who lives in such delusion in the same boat with many other classes? For instance, there are those men who set themselves up as judges of horseflesh; they never in the slightest degree realising the *complexity* of the subject on which they pronounce their confident judgments, though it is perfectly clear to a man of discernment that the intrinsic value of an individual horse as a useful animal can only be discovered by long-continued trial. Politicians and philanthropists, again, deal with questions of great complexity without even for the most part ever discovering that they are so. No failure in the past abates their confidence as they press forward with one idea in their heads. Then there is the weather prophet. He, deluded creature, will call his forecasts "scientific." His case clearly justifies the belief that there can be men who hold that they play a superior "scientific" game, when in truth their play is in effect in no wise superior to that of any person with a passable memory, who can keep his mind on the card-table, and who properly appreciates the old proverb about "a bird in the hand."

Self-delusion being the explanation, we need not be astonished at what would otherwise be very surprising, namely, new orthodoxies springing up in whist, over-confident people now putting forward fresh discoveries, which they suppose to have been overlooked by hundreds of thousands of players of past generations, who gave up almost their whole minds and time to the game. Neither need one wonder at seeing each high priest protesting that the other high priests have really no scientific knowledge of the game on which they presume to instruct the laity. FRANCIS RAM.

Mr. Ram need not have been at the pains to go so far afield for illustrations of persons who knowing nothing of a subject delude themselves into the belief that they know a good deal. Every paradoxist shares this delusion, and internal evidence might have shown Mr. Ram how natural it is.

I may state one or two facts which should help to put Mr. Ram right, only I fear he will not accept them.

First, scientific play does not depend quite so much on imaginary advantage as Mr. Ram imagines. The matter has been put to the test in the most crucial manner—scientific play being matched against unscientific over the selfsame hands dealt in the usual way to a set of players in one room, and repeated card for card for players in another room, and the superiority of science thus tested has come out in a way which surprised even experts. The details of the experiment are given in "How to Play Whist," pp. 199 to 201. Suffice it here to say that, in all, sixty-six hands were played, absolute equality being secured in regard to cards; and the scientific players came out *eleven* points, *one* rubber, and *twenty-one* tricks ahead of the unscientific! Of course, the estimate by tricks is the truest; and it is remarkable that, although, as luck would have it, the cards were very unequally divided in the two rooms, insomuch that in one room the good players were eighteen points *ahead*, while in the other they were seven points *behind*, they came out ahead, *as regards tricks*, in both rooms, being nineteen ahead in one room, and two ahead in the other!

In passing, I may note, that I, of all men, least deserve to be charged with despising Home Whist, having written a little book under that name for the special inculcation of correct play. For two years past I have enjoyed sounder and better whist in my home circle than I have ever had or have ever seen played (in so many as half a dozen consecutive sets) at any club. I have seen sound play matched against the clever plans of first-rate players of their own hands (or "bird-in-the-bush" players) for game after game, till the tricks (honours being left uncounted) have amounted to thousands, and with as steady a gain by scientific play at rates ranging from 8 to 12 per cent., as though the cards had been packed to secure it. I have seen scientific combined play matched against the uncultured whist of a keen card player having single dummy for partner, and even here, where the odds are supposed to be nearly 10 per cent. in favour of dummy, scientific play has prevailed decisively (about 9 per cent.). At double dummy, of course, science is everything, and it very seldom happens that even at a single sitting of any length science is beaten by lucky cards.

But in fact scientific players can recognise every trick secured by sound play or lost by irregular play. When an opponent, by playing out his aces and kings, gives up command, and lets long suits come in and make trick after trick, the scientific player does not need much of his science to see how his gain has been made. When a clever bumblepuppist craftily leads a singleton and rejoicingly makes his ruff, the scientific player knows just how it has happened that through that too clever dodge three or four tricks have come to him which otherwise he would never have made.

If Mr. Ram has ace, queen, and a small one of a suit, and the eleventh round has come, the enemy on his left holding (to the knowledge of every observant player at the table) king, knave, and a small one, he makes his bird in the hand the ace, lamenting only his bad luck, not his feeble play, when two tricks go to the enemy; but if, under like circumstances, a correct player leads the small one, and on the return of the suit makes both the ace and queen, nothing will persuade the unskilful player that the result came from no groping in the dark, but was simply inevitable, and as obvious beforehand to the sound player as the sun in a clear sky. Even if by some amazing chance one can show a player of this sort that in such a case science has saved a trick which nescience would have thrown away, he cannot see the importance of the point. "A trick here, or a trick there, what can that matter?" he will say. "Why, you yourself admit that by bad play a trick may be made which sound play would have lost. One set of casual tricks balances the other—for anything you can tell," and so forth. But that is just what science knows not to be the case. The scientific whist player can look on complacently when bad play wins a trick here or a trick there, knowing that in the long run all *such* gains are balanced by corresponding losses; the scientific whist player can in like manner complacently see play which he knows to be best five times out of nine, turn out badly four times for every five times that it turns out well; but science knows assuredly that every trick made by scientific play where unsound play would have missed it, is so much to the balance of gain which in the long run is bound to stand out beyond the gains and losses either way depending on the mere run of the cards.

As regards his closing remarks, that authorities dispute

over the scientific principles of whist, I need only say that Mr. Ram must be quite unacquainted with the literature of the game. There are not two opinions on any one of the leading principles of whist play. The questions which Mr. Ram has seen discussed have had about as much to do with whist science as a discussion about the best pattern for the backs of cards would have had. All the discoveries which various writers on whist have claimed to make have related to methods of indicating the nature of the players' hands without actually showing the cards. The science of whist indicates the best way of playing such and such cards under such and such conditions. Experience and practice enable good players to infer where the cards lie, and so to ascertain under what condition they are pursuing their strategy. Methods have been devised (more or less recently) for showing certain details of a player's hand independently of inferences based on his strategy. The differences of opinion which have arisen respecting these methods relate to no principles of whist science, but to the questions: First, whether the game is improved or impaired by devices which tend to assimilate it to double dummy; secondly, whether the greater advantages which skilful (as compared with unskilful) players may gain from such devices are fair advantages; and thirdly, whether, with players of average skill more is gained by informing partner about details of one's hand, than is lost by giving the opponents that information.

The fact that I am bringing out in these columns the whist science of old Mathews as well worth studying by modern players, shows how little the principles of scientific whist have changed since Mathews' day. But I am no more at issue with any of the leading whist-players of to-day about whist principles than I am with Mathews or his predecessor Hoyle. (Here and there views have changed about some detail or so, depending on nicely balanced chances—as in the case of the old lead of Queen from Queen, Knave, nine, now only adopted on special occasions, and in regard to covering an honour with an honour second hand; but I have been speaking of leading principles.) With regard, however, to the signalling methods now in vogue, and little likely to be given up, I certainly hold strongly now by the opinion that, though they have introduced no new scientific principles (nor have been advanced, I suppose, with any idea of changing the principles established of old), they have greatly injured whist as a recreation. Weak players have become relatively weaker since they consented to let these signals be introduced—precisely as they would become relatively weaker still if they allowed kicking under the table, significant coughing, sneezing, drumming, and the like, to be adopted as systems of legitimate signalling. They would become weakest of all if a kind of whist were introduced which would be the most difficult and the most scientific game of all—whist in which all four hands were displayed as they practically are in double dummy, but four players were engaged as in common whist. This, by the way, would be a magnificent game so far as its dependence on skill was concerned; but as a recreation it would be altogether inferior to whist as ordinarily played.

Lastly, I may remark on the idea underlying Mr. Ram's letter, that where there is chance there can be no science, because there can be no exactitude. Science seldom secures exactitude, though it strives after it. But if there is a subject about which science is exact, it is in the existence of law in chance results. A game depending on the throwing of dice may be a pure chance game in one sense; but the player would come out badly in such a game who should fail to recognise the exact scientific value of the chances involved.

WATCHED BY THE DEAD.

NOW in "Edwin Drood," the first part of the story, that is the part which ends with the disappearance of Edwin and the close of the sequent inquiries (constituting the first sixteen chapters), forms but one-third of the book as left by Dickens. Had no more been written more might still have been guessed as to the interpretation of the mystery than could have been readily guessed about the "Moonstone" mystery if only the first part of Mr. Collins's story had been completed. Apart from the feeling, not to be explained or communicated, which assures those who understand Dickens's manner and know the meaning of his tones, that Drood is not dead though changed, there is clear evidence not only that Drood is alive, but that Grewgious knows Drood is alive.

We will note first what every reader ought to note, though somehow it has been overlooked by many; we shall then touch on a circumstance which might naturally enough escape notice, though when once noticed it is decisive.

Grewgious is not a suspicious man, though keen and observant, with a very strong sense of what is just and right. He had had no suspicions of Jasper. The interview between him and Jasper in Chapter IX.—the last before the disappearance of Drood—is perfectly friendly. Nay, Grewgious, a man who could not pay compliments, says in that interview, "Come, Mr. Jasper; *I know your affection for your nephew*, and that you are quick to feel on his behalf." When Jasper accepts the compliment "with a friendly pressure of the arm," Mr. Grewgious "nods his head contentedly." He shakes hands in the most friendly way with Jasper at parting, though rather quickly correcting Jasper's "God *save* them both" into "God bless them both." Contrast this with Mr. Grewgious's behaviour when next they meet, and we feel at once that Grewgious has learned, *somehow*, that Jasper is the wretch we know him to be—or, as he puts it later, that Jasper is a wild beast and a brigand. A very short time has passed since their friendly interview; nothing has ostensibly happened to shake Grewgious's confidence that Jasper loves Edwin Drood; and Grewgious is understood to have every reason to regard Jasper with special sympathy. For Jasper's well-loved nephew is supposed to have been murdered; and for many hours Jasper has been "working and toiling" to find traces of his nephew—"now in barge and boat, now ashore among the osiers, or tramping amidst mud and stakes and jagged stones in low-lying places, where solitary watermarks and signals of strange shapes showed like spectres." He has just returned home exhausted—"unkempt and disordered, bedaubed with mud that had dried upon him, and with much of his clothing torn to rags." Surely a man to be very much pitied by Grewgious, who "knows his affection" for the missing man. Nothing but absolute certainty that Jasper is a murderous villain could now prevent Grewgious from showing him such sympathy as even Crisparkle, angry though he is at the suspicions cast on Neville Landless, does not refuse. (It is important to notice that Mr. Grewgious knows little or nothing about Neville.)

So far, however, from showing any sympathy with this unkempt, exhausted, and miserable man, Grewgious is curtly abrupt at the very beginning of the interview, and shows a hardness and cruelty to Jasper as it proceeds such as nothing but the absolute certainty that he sees Drood's would-be murderer before him could justify. Grewgious, who knows scarcely anything about Neville, has no special reason to be angry at suspicions cast upon that young man. Yet every word of Jasper's implying suspicion of Neville, however indirectly, is sharply corrected. "Have you seen his sister?"

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Jasper asks, Neville's name not having yet been mentioned. "*Whose?*" asks Grewgious, curtly and turning his eyes with exasperating coolness on Jasper's face. "The suspected young man's," Jasper replies. "Do *you* suspect him?" Grewgious asks.

But even this is little. Grewgious has come to tell Jasper that which, if Jasper were innocent, would only interest him, and would certainly not be particularly distressing in the midst of the intense anguish and suspense Jasper is supposed to be enduring—viz. that Edwin Drood and Rosa were no longer betrothed when Drood disappeared. Only if Jasper had murdered, or supposed he had murdered, Drood, because of a furious hatred of his nephew as betrothed to Rosa, would the information have any special significance at all. But if *that* were so, it would indeed be a terrible blow to Jasper. It would not only show him that he had plotted, and so far as he knew carried out his murderous scheme, against a man of whom he had no reason to be jealous, but that actually his murder had helped to remove an obstacle from the path of a more dangerous rival.

Now, if we merely note that Jasper receives Mr. Grewgious's news with horror, we find nothing particularly significant in this scene. But there is much more in it. Grewgious *knows* that his news will be received with horror. He warns Jasper of this, and even offers to put off the communication till the morrow, possibly because he feels a pity for the weary wretch before him, villain though he knows Jasper to be. But as Jasper concentrates his attention to listen, Grewgious resumes his determination, "with compressed and determined mouth, *now*," he looks at the fire, as with provoking slowness and "internalness" he opens the statement. As he reaches the part which will move Jasper, Grewgious "looks fixedly at him sideways." Jasper's face grows ghastly before him; but he has no compunction. Sentence by sentence he strikes the wretch, till at last he "saw no ghastly figure, sitting or standing; saw nothing but a heap of torn and miry clothes upon the floor." "Not changing his action even then, he opened and shut the palms of his hands as he warmed them, and looked down at it." If Grewgious did not know him for the murderous wretch he was, his treatment of Jasper here, and afterwards, is sheer brutality; yet Grewgious is a kindly man and a gentle. It is absolutely certain, then, from this scene alone, that Grewgious knows what Crisparkle, Neville, and the rest do not know, or even suspect, that Jasper himself has striven to murder, and in intent has murdered, Drood.

From whence can Grewgious have learned this? He might have learned some few facts from Rosa which would suggest suspicion—as that Jasper was jealous of Drood, that she herself had an indefinable and inexplicable dread of her music teacher, nay, that she had striven to warn Drood against Jasper. But even if we were not clearly told in Chapter XX., six months after the disappearance, that Rosa was ashamed of her own suspicions (mistakenly judging of Jasper's conduct by such rules as might apply to average men, but not to "a horrible wonder apart," like him), we should be sure that nothing which so delicate and sensitive a mind as hers could have communicated to Grewgious would have sufficed to convince him that Jasper was Drood's murderer. The knowledge of which Grewgious made such terrible use might, of course, have come from Rosa; it would, indeed, have very naturally been imparted to him by her: but his knowledge that it would torture Jasper, his certainty that Jasper deserved to be so tortured, his manifest conviction that Jasper was a murderous villain deserving no mercy, *these* could not possibly have been derived from anything Rosa had said to him. We might interpret part of Grewgious's conduct, indeed, by supposing that while he had learned from Rosa about the breaking off of the engagement, he had also discovered that Drood had been murdered, and murdered by Jasper. This, of course, might easily have happened. Durdles, with that curious gift of his, by which he could tell when there was anything inside a tomb (a gift enabling him, in one specified case [see Chapter V.], to find how one of his workmen had left some rubbish in a six-foot space inside a tomb), might well be supposed to have discovered Drood's body, and the quicklime cast over it by Jasper, on the very night of the murder (assumed, on this view, to have been accomplished), and he might have brought to Grewgious convincing evidence that Drood was killed, and that Jasper had done the deed. This would account for everything we have thus far mentioned. But this explanation must, for another reason, be absolutely rejected: it will not hold water for an instant. If Grewgious (to say nothing of Durdles) knew that Drood was dead, even without knowing further that Jasper had killed him, he would assuredly not have let the matter rest here. He is a man singularly obedient to the dictates of duty; and he would know that duty imperatively required him, in the case supposed, to make known such facts as this explanation assumes him to have learned. It would have been utterly inexcusable, nay, it would have made him an accessory after the fact, and have been justly punishable as a crime if he had not brought his knowledge at once to light, while the evidence which had satisfied him still remained available for the purposes of justice. We may set the idea utterly on one side that Grewgious knew Drood to have been actually murdered by Jasper.

Since it is certain that Grewgious, during this remarkable interview, knows Jasper to be a murderous villain, while it is equally certain that he knows Jasper is not actually a murderer, nothing remains but that we should conclude that Grewgious knows Drood to be alive while he also knows him to have been murderously assaulted by Jasper, nay, flung into the tomb, after the jewellery so well known to Jasper had been removed. Grewgious would know also that Jasper supposed he had heaped quicklime over Drood's dead body, so that all trace of that body and of its clothing might in a few hours be destroyed. For we know this to have been part of Jasper's plot; and manifestly Grewgious knows everything Jasper had plotted.

While thus, *and thus only*, can Grewgious's conduct be explained—his torturing Jasper without compunction, on the one hand, and his not striving to bring him to justice on the other—we find here the explanation of a little detail which no one seems to have specially noticed, though it is singularly significant—in fact, absolutely decisive.

Just before Drood vanished, Grewgious had entrusted to him a ring which was the sole memento Grewgious had of Rosa's mother. He had loved her, and loves Rosa because she reminds him of her so strongly. He could hardly bear to part with the ring, even to Rosa. "It was hard," he says, "to lose the ring, and yet it must have gone from me very soon." For it was to be given to Rosa on her betrothal. But he charges Edwin solemnly, "by the living and by the dead," to restore the ring to him if Edwin's engagement to Rosa is cancelled. "Will it come back to me?" he asks himself sadly, when Edwin has taken it away. "My mind hangs about her ring very uneasily. But that is explainable. *I have had it so long, and I have prized it so much!*" (All this means, for all who understand Dickens, that the ring is presently to be in danger of disappearing.)

That ring was not given to Rosa. "Let the sorrowful jewels be," Drood said to himself. He would restore them to Rosa's guardian "when he came down; he in his turn would restore them to the cabinet from which he had unwillingly taken them." "Let them be; let them lie unspoken of in his breast. . . . *Among the mighty store of wonderful chains that are for ever forging, day and night, in the vast iron-*

works of time and circumstance, there was one chain forged in the moment of that small conclusion, riveted to the foundations of heaven and earth, and gifted with invincible force to hold and drag."

Grewgious knows that the ring he so prized has not been given to Rosa. He knows it is not among the jewellery found by Crisparkle in the river. Yet he says nothing! He neither causes search to be made for jewels which were of such interest to himself, nor does he say aught which would lead to this particular clue being so followed that perhaps by its aid the murderer might be brought to justice! We venture to say that Dickens had made no such blunder as this view would imply. It was not without a special purpose either that he dwelt on Grewgious's sorrow and anxiety about the ring, or that he directed the reader's special attention to the ring as eventually to lead to the detection of the criminal. He himself had that ring in his thoughts throughout all the circumstances following Drood's disappearance. He must also have known that though careless readers might overlook the ring, or at least the interest of Grewgious in it, some among his readers would assuredly notice the point.

Grewgious is not careful about the ring, or about the detection of the supposed murderer, *simply because he has the ring back in its cabinet*, and because he knows of Jasper's attempted crime, and of Jasper's stroke having failed of its aim. He says in Chapter XXII. he "holds decidedly that John Jasper is a brigand and a wild beast in combination." Such a man as he would have said nothing like this unless he had known of Jasper's murderous assault on Drood, and of his being to all intents and purposes a murderer. Such a man as Grewgious would assuredly not have suffered the prized relic of his lost love to be in the hands of a villanous wretch like Jasper, or to disappear without an effort to trace it. But he could not have learned anything about the ring, nor could he have learned aught about Jasper's villany, except from Drood himself (for, as we have seen, the mere discovery of Drood's body with the ring upon it is not an admissible explanation).

So much established—beyond, we think, any possibility of question—the explanation of "the Datchery assumption" is no longer difficult. But we believe that this assumption, to use Dickens's own word, can be interpreted independently of the decisive evidence obtained from the behaviour of Grewgious.

We know that the very last reference by Dickens to his story was an expression of anxiety lest, in the treatment of the Datchery assumption in the last chapter, he should have shown too clearly how the story was to be developed. We think the fear was fully justified. For we cannot see how any one who understands Dickens's manner can read that last chapter without being convinced that Datchery is Drood. In the earlier part about Datchery there was more care to conceal his identity. Even a fairly careful reader might doubt whether the character were an assumption at all—except, perhaps, for the obvious fact that Datchery wears a wig of white hair, and the probable circumstance that the eyebrows are dyed black (or they would hardly have been mentioned). Even though the careful reader may decide that Datchery is disguised, he would scarcely be led to conclude that Datchery is Drood, clearly though he may have seen that Drood is not dead. Dickens artfully makes Drood inquire about Mr. Tope as if he knew nothing of the verger, and still more artfully makes Drood lose himself on his way from "the retiring Crozier" to Mrs. Tope's rooms. Of course the inquiry corresponded well with Datchery's obvious wish to conceal his identity; while Drood's losing his way, even if not regarded as part of the same plan, would be only too easily understood by any one who has resided in a cathedral town and knows how readily one may get "very cold indeed" in the search for even a well-known nook from an unknown hotel "of retiring disposition" like the Crozier. (We know Rochester—Cloisterham, that is—pretty well; but we would certainly not undertake to find our way easily through all its labyrinthine passages.)

Of course, with the knowledge that the Datchery character *is* an assumption, as Dickens told Miss Hogarth later, even the scenes in Chapter XVIII. suffice to show who Datchery is. There is no one in the story but Drood himself unaccounted for, except only Bazzard. Now Bazzard is not only a fool, but a dull one, and a curmudgeon; Datchery is neither the one nor the other. Bazzard has no sense whatever of humour; Datchery is full of dry fun. Bazzard is as clearly intended to come to utter grief in the end as was Silas Wegg in "Our Mutual Friend;" Datchery is just as clearly intended to triumph in his plans. One might almost as reasonably imagine that Datchery is Honeythunder as that he is Bazzard.

But in the last chapter of the book the evidence that Datchery is Drood is so clear that no one can doubt its meaning, though many may overlook its existence till it is pointed out.

We would in particular invite all who love the writings of our later "Wizard"—the Wizard of the South—to compare very carefully the scene between the opium-eater and Drood in Chapter XIV. and the scene between the same opium-eater and Datchery in Chapter XXIII. It would not be fair for us to quote, as we might do, sentence after sentence from one scene for comparison with sentence after sentence from the other. Let the reader who has not yet done this do it for himself; he will be well repaid. The close resemblance between the characters of Drood and Datchery will at once be obvious; the humour and the pathos of each will be fully appreciated. Of course, we compare Datchery only with Drood as seen in that last scene before the disappearance, when sad after his parting from Rosa, whom he loves—though even then he does not know it, "the vanity and caprice of youth" (soon to disappear for ever) "sustaining the handsome figure of Miss Landless in the background of his mind." The Drood of the earlier scenes is dead—"Poor youth, poor youth," Dickens says of *that* Drood; and many readers suppose he has condemned Drood altogether to death.

But the closing passages of the two scenes must be quoted to show how absolutely identical are the tones in which Drood and Datchery are spoken of, though of course we cannot make this clear to those who have no ears for such tones:—

From Chapter XIV.

This is not an inspiriting close to a dull day. Alone, in a sequestered place, surrounded by vestiges of old time and decay, it rather has a tendency to call a shudder into being. He makes for the better-lighted streets, and resolves as he walks on to say nothing of this to-night, but to mention it to Jack as an odd coincidence to-morrow; of course only as a coincidence, and not as anything better worth remembering—still it holds to him, as many things better worth remembering never did. He has another mile or so to linger out before the dinner-hour; and, when he walks over the bridge and by the river, the woman's words are in the rising wind, in the angry sky, in the troubled water, in the flickering lights. There is some solemn echo of them even in the cathedral chime, which strikes a sudden surprise to his heart as he turns in under the archway of the gatehouse.

From Chapter XXIII.

Mr. Datchery pauses with the selected coins in his hand, rather as if he were falling into a brown study of their value, and couldn't bear to part with them. The woman looks at him distrustfully, and with her anger brewing for the event of his thinking better of the gift; but he bestows it on her as if he were abstracting his mind from the sacrifice, and with many servile thanks she goes her way. John Jasper's lamp is kindled, and his lighthouse is shining when Mr. Datchery returns alone towards it. As mariners on a dangerous voyage, approaching an iron-bound coast, may look along the beams of the warning light to the haven lying beyond it that may never be reached, so Mr. Datchery's wistful gaze is directed to this beacon and beyond.

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Rightly to understand the force of the resemblance between the two scenes, of which these passages are the close, it must be remembered that if Datchery is really Drood, then in each scene we have the same person; in each scene Drood shows the same kindly and considerate way of talking to the old and feeble ("always kindly," we are told of Drood; and as kindly to the child as to the aged, if Datchery is Drood), in each Drood has been reminded by the old opium-eater of his love for Rosa; in the first he had just made the sacrifice of that plighted troth which he had but then learned to value; in the second his thoughts were on that sacrifice—no other—when the old woman thought he was weighing the value of a few coins; in one scene he has a foreshadowing of the danger to be feared from Jasper; in the other he knows the danger he has to face in exposing Jasper for the villain he is. We can understand, then, how it comes to pass that the selfsame tones are heard in both passages throughout both scenes. Even the old opium-eater somehow felt, she knew not how, that the white-haired man addressing her was no other than the "young gentleman" she had met there before.* We must not be duller-witted than she was.

Note, further, that when Datchery had met Jasper without being detected, he regarded that as a difficult task achieved—"For a single buffer, living on his means," he said, "I have had a rather busy afternoon." But after the scene with the old opium-eater, he says of his work, "Hum! ha! a very small score, this; a very poor score." Albeit, when he finds that she has, like himself, a strong feeling against Jasper, he adds "a thick line to the score, extending from the top of the cupboard door to the bottom," and falls to "on his breakfast with an appetite"—these being the very last words of the story, and significant words they are.

Some other points disclosed in the story as written may be noticed here, though, in truth, it would be easy to fill a volume with the consideration of the multitudinous touches introduced by Dickens into this only half-written novel. It is clear that Rosa knows perfectly well that Drood is not really dead. Of course, Grewgious would not let *her* for whom he had such tender and chivalrous feelings remain a moment in doubt on this point. But, apart from that, her whole conduct is inconsistent with the belief that she is as troubled by the mystery of Edwin's disappearance as she certainly would have been, sensitive and tender-hearted as she was, had it really been a mystery to her. Even the way in which she speaks of Jasper to Grewgious as "his uncle," shows that they both think of Drood as a living man. But this is shown even more clearly by the very passages which some regard as suggesting that she sorrows for Edwin as dead. When she is first beginning to be in love with Tartar she thinks of Edwin, saying, "Poor, poor Eddy!" Now, had she formerly loved Edwin, the newly-born love for Tartar, Edwin being dead, would have suggested this thought, naturally enough. But as she had never felt more than a sisterly love for Edwin, it is clear there is another meaning in her sorrowful thought of him; and what else should it be but the thought that *now* there is no hope for Edwin that she ever can love him. She knows Edwin is alive; she knows that Edwin loves her; she has heard this through Grewgious, and has even promised Grewgious (probably) that if ever the time should come when she may feel love for Edwin she will say so. When she comes to Grewgious after Jasper had terrified her, and has begun by saying that "she had taken a sudden resolution," she remembers this promise, and, lest Grewgious should think the sudden resolution related to Edwin, says in the same breath, "Poor, poor Eddy!"—an exclamation which the keen old man is not at a loss to understand, as we note by his sympathetic response. And every expression of regret for Eddy on Rosa's part will be found to relate to her dead love for him, or rather for the love that had never lived.

How, then, was the story to have ended? It appears to us that, independently of what Dickens said to Forster on this point, the end is very clearly foreshadowed. Of the four men who are in love with Rosa, two are to die. Jasper will be driven to the tomb where he supposes Edwin's dust to lie, to seek for the ring of which in due course Grewgious will tell him.* There, seeing his supposed victim (as the outside pictures of the original monthly numbers show Edwin Drood) standing alive and threatening, he would fly with a shriek from the menacing vision, as he would consider it, to be pursued by Neville, Tartar, and Crisparkle (as also shown on the cover) up the winding stairs along which he had led Drood a year before to his doom. In this pursuit, or rather in the attack on Jasper, Neville was to be slain. (No character in all Dickens's novels was ever more distinctly doomed to death, by the clear evidence of the narrator's tones, than Neville Landless.) The death of Jasper was, we conceive, to have been like that of Jonas Chuzzlewit and of Slinkton in "Hunted Down;" Rosa was to marry Tartar; and Helena, Crisparkle. We imagine that Dickens would have found noble exercise for his special powers in showing Neville Landless rejoicing in the happy fortune of Tartar's love for Rosa, though he had viewed so angrily Edwin's seemingly prosperous love, in the days when Edwin was not in earnest and did not even know the love that was in his heart. Edwin was doubtless to remain to the end devoted to Rosa, even as Grewgious had remained devoted to the memory of Rosa's mother. There was to have been no bitterness, however, in Edwin's heart towards Tartar in regard to his own less fortunate love. A certain wistfulness such as we see already in Datchery, and on Rosa's part a certain sad regretfulness—nothing more: nothing to pain those who had followed Edwin's story, more than we are pained by the gentle tenderness of Tom Pinch's love for Mary Chuzzlewit—a love as tender and as pure as his love for her as Mary Graham.

OYSTER-OPENING MONKEY.—Mr. Alfred Carpenter, of the Marine Survey Office, Bombay, has observed Macacus monkeys on the island off South Burmah opening oysters with a stone. They bring the stones from high-water mark down to low water, selecting such stones as they can easily grasp. They effect the opening by striking the base of the upper valve until it dislocates and breaks up. They then extract the oyster with the finger and thumb, occasionally putting the mouth straight to the broken shell. The way they have chosen is the easiest to open the shell.

* It was no new idea of Dickens's thus to picture the unconscious influence of individuality making itself felt through all disguise, through all real change of condition. We have already noticed one case—viz. where Mrs. Boffin somehow feels that John Harmon, whom she had last seen and known as a child, is near her, when the real John Harmon is there disguised as the secretary, Rokesmith, and now a man who, though still young, has been made serious and grave by many sorrows. And there are many other examples. Of course we are carefully told that the old woman was reminded of the former meeting with Drood "by the sight of the place" But this is only to blind us as far as possible to the truth that she recalls the former conversation, because, changed though he is in appearance, she is talking to the very man with whom she talked before.

* In the singularly amusing conversation between Grewgious, Crisparkle, and (eventually) Tartar, a conversation in Dickens's best style, Grewgious, in advising that the caller (Tartar, as it turns out) shall be admitted, remarks that it is well to take advantage of any such opening as may present itself. "I could relate an anecdote in point," he says, "but that it would be premature." It is impossible to say what this refers to, but one may guess that perhaps Grewgious when in Cloisterham had looked in at the jeweller's who had talked with Drood about his jewellery, and from him learned (what Drood had learned) that Jasper had a most exact knowledge of all Drood's ornaments. This would have suggested the power of the ring to hold and to bind the guilty wretch.

A STUDY OF CHILDHOOD.

THE profoundest philosophers of our day have not thought it beneath them to discuss matters which are commonly regarded as outside the domain of science, in a truly scientific spirit. Faraday analysed a tear; Darwin has based important theoretical views on the analysis of a smile, a frown, a sneer, a gesture of hand or head or shoulders. Darwin noted in particular the expression of the emotions in very young children—a subject of inquiry of extreme importance when it is considered that, according to the Darwinian theory of the origin of man, we should find in very young children the strongest indications of those characteristics which link the human race with races next below them in the animal world. In the unborn child may be traced the various stages of progress, from the ascidian to fish-like and thence to reptilian forms, and so onwards to the lower and thence to the higher mammalian type. The newly-born child shows in many characteristics, which disappear with advancing years, his kinship to the most advanced mammalian type short of man. As time passes, the simian characteristics are replaced by those which are now recognised only in uncivilised races—the progression not ending in infancy, however, or even in early youth, but (at any rate with the best representatives of civilised races) continuing into middle life. Since our kinship with savage human races is not questioned (though for aught that appears it might very well have been doubted, and is, indeed, as it is, altogether misunderstood by many), there is more scientific interest in the study of the very young child, whose movements and characteristics, carefully observed, throw clearest light on the question of man's kinship with the higher mammalian types.

Hitherto the mental and physical development of very young children has not been systematically studied. Tiedemann, in the last century, gave some attention to the subject, but his work has little value in the present day. In a work of some 440 pages, Professor Preyer, of the University of Jena, made the first three years of a child's life the subject of careful and systematic study. He carefully considered the progress of the child from week to week, or the apparent cessation of progress in various parts of the child's development, and attempted to explain the various phenomena successively observed. It is hardly necessary to say that the standpoint from which Professor Preyer observed and made his inferences was that of the evolutionist. Aided by his study of the ways and habits of the young of lower forms, Professor Preyer analysed the phenomena of the infant mind with a success which perhaps he otherwise would hardly have been able to achieve.

Professor Preyer worked on a single subject—a boy of his own. Here, at the outset, it is to be noticed that while many of his observations may be such as would have been noted in other cases, perhaps in all, observations made on one child cannot possibly be regarded as establishing general laws of infantile development. If we consider how much children differ in such matters as the time when they begin to talk and to walk, we shall see reasons for believing that they differ also greatly in those other matters more delicate of observation, with which Professor Preyer here deals. I have had opportunities of noting the development of fourteen infants, in one family (my own), in which one might fairly expect a greater uniformity than among children of different families; and I can answer for it that the differences as to such matters as first noticing light, distinguishing colour, making first attempts at touching, grasping, and so forth, recognising and responding to varying expressions of the parents' or nurse's countenance, &c., are very great indeed. Professor Preyer recognises this, of course. He knows that such differences exist among the young of all races. He compares as far as possible his own observations with those of others. But it is important to notice how very necessary in this research are abundant observations made on a great number of children belonging to different families.

Almost every day Professor Preyer made observations three times, morning, noon, and evening, on his little "subject." He made experiments, also, unhampered by the customary modes of infantile training, which would, of course, have interfered with his operations. Necessarily, however, he had to rely for some of his observed facts on others. He found an ally in Mme. Preyer, who probably took quite as much interest in the child's progress as he did. Whether on one or two occasions she may not have misinterpreted what she saw in a manner unduly complimentary to the child's intellect, our deponent sayeth not; it seems not wholly impossible.

The first sense considered was sight, though probably feeling is the first sense exercised. He considers that sensibility to light exists from the moment of birth. Yet probably this sensibility is more alive to the sense of feeling than to that of sight. Be this as it may, the infant from the first closed its eyes when exposed to a strong light. With regard to actual sight, as denoted by the fixing of the eyes on objects, Professor Preyer says that up to the tenth day he noticed no movements indicating that the child fixed its eyes on an object. The child seemed only to look at objects before it up to that time. Now here observation will show that infants differ greatly. I am sure some children fix their eyes on objects long before the tenth day; and I knew of one case, a little girl of my own (exceedingly nervous and supersensitive throughout her short life of eight months), of whom I should say that she certainly followed with her eyes in the most definite way a light which was being shifted about in the room in which she was born, when she was less than half an hour old, were it not that the thing seems so incredible I am half disposed to think it can only have been some strange chance which caused her eyes thus to move. During the few minutes that I was allowed by an authoritative nurse to watch the little creature, her eyes while open—say in all some fifty or sixty seconds—were constantly fixed on the light and followed it when it was moved. On the following evening, when she was some twenty hours old, there could be no mistake about it; but during the day (Christmas Day, 1871) I had no opportunity of noting whether objects not so well defined as a light were equally noticed (or rather, looked at, for there may have been no noticing in the matter). Professor Preyer says that a child may "turn its head towards a source of light—as the window, just as it turns its head towards the breast, through an association with pleasure." Yet this, I think, can hardly be the explanation of the observed fact that an infant less than twenty-four hours old turned its eyes on such an object as the flame of a wax candle. In fact, Professor Preyer puts such an observation as this at a much later date. "The second stage," he says, "is reached on the eleventh day, when the child, after staring at one bright object (the author's face), turns the head to another, a light, near it; and the third stage is entered upon on the twenty-third *day*, when the child follows a candle, held one metre (say 34 feet) before the eyes, to the right and left, upwards and downwards, with the *eyes* and without any movement of the head." This third stage, I can answer for it, was entered upon by my little daughter before she had reached her twenty-first *hour*, and unless I was greatly

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misled by merely chance movements of the eyes, some twenty hours earlier still.

The last stage of eye direction "is that in which the child is able to turn the eye towards an object, and to seek for new objects in the field of view. This stage is reached (it should be this stage was reached in the particular case in question) in the first quarter. On the eighty-first day, the child turned its eyes seeking an object (a drinking-glass) which was emitting tones."

The power of judging direction and distance is closely associated with these first experiments in seeing. Professor Preyer says that in the sixty-eighth *week* the child still grasped at objects lying beyond his reach. "On this," Mr. Sully remarks, "it seems to me there must be great differences here. I tried a boy of mine with an object when just six months old. If the object was held a foot or less beyond his reach he made no movement. But as soon as it was brought pretty near the accessible point he made a decided grasping movement." A boy of mine, five months and a few days old, amused himself in the early morning hours (much too early for my comfort or his mother's) in grasping and pulling towards him the red lining of our bed curtain, which is carried round the top of his cot. He made no attempts of the kind if (as in the warmer weather) it was placed where it would be some five or six inches beyond his reach. When he was five months and one day old he tried to pull the lining so as to get it into his mouth, but could not, because even with a stronger pull than he could give it would only reach within some three or four inches of his mouth. On this he put two hands down beside him, and, hoisting himself up, laid hold of the lining with his not quite "boneless gums." There must have been some judgment of distance and direction here, because his eyes could not guide the capture, as when it was made with the hands.

Hearing is defective for several days after birth. Young mothers should note this, by the way. I have known cases where a mother has feared that her child was born deaf because it paid no attention to noises not accompanied by movements it could feel. In one sense every infant is born deaf, owing to the condition of the aural conduits; and even when the organs of hearing are no longer impeded there is often no power of discriminating sound for several days.

Professor Preyer found, he says, that "the first unmistakable movements of the head in the direction of a sound occurred in the eleventh week." (This seems not quite consistent with his statement that on the eighty-first day the child tried to look at a drinking-glass which was emitting sound.) At the end of the sixteenth week the movement of the head in the direction of a sound—that is, so that the eyes were directed towards the spot whence the sound came—"had attained the precision and certainty of a reflex movement."

The sense of feeling is next dealt with by Professor Preyer. His observations seem to show that the surface of the body is somewhat less sensitive to touch just after birth than it afterwards becomes. So also the difference of sensibility in different parts of the body increases for some hours after birth. Immediately after birth the body seems almost insensible to variations of temperature, but soon becomes tolerably keen. Thus, when the bath was cooled down to $32\frac{1}{2}°$ centigrade ($90\frac{1}{2}°$ Fahrenheit) the child appeared content, but with a further lowering of $1\frac{1}{4}°$ centigrade ($2\frac{1}{4}°$ Fahrenheit) the child began to cry.

The most perfect sense at birth is taste. "The discrimination of quality, namely, sweet, bitter, salt, and sour, is possible from the first, provided sufficiently strong stimuli are employed. If weak solutions are used the tactual sensation overpowers the gustatory, and the child is indifferent."

The sense of smell seems at first to be associated with the sense of taste. In the seventeenth month, when a hyacinth was held to the child's nose, the youngster tried to take it into its mouth. It is not altogether clear, however, that the sense of smell is distinct from that of taste. Professor Preyer considers that the first odour known to the child, that of its mother's milk, is so inseparably bound up with the pleasure of feeding and the sense of taste, that the child argues in this case the smell is pleasant, therefore this is something nice to eat. But the senses of touch and sight are involved here, and it seems to me, from what I have observed in a great number of cases, that they have at least as much to do with the child's attempt to eat what is offered to it as any sweet smell the hyacinth might have had. If a piece of twisted paper, or a ball of cotton, is held to a child's nose, he will take it into his mouth, though it has no odour, pleasant or otherwise. This habit continues to the middle of the second year, or even later, though after the first eight or nine months the child's wish seems not so much to taste as to test the object presented to it.

Professor Preyer considers that fear is an inherited instinct with young children. Of this there can be very little doubt; though it is to be noticed that children in the same family differ very much as respects timidity, both in regard to the degree of fear they show under the same conditions and to the circumstances which chiefly affect them. In some cases fear doubtless results from association, and may often be ludicrously out of proportion to the exciting cause. A boy of mine who during his first teething had been in charge of a strange nurse, showed signs of anxiety afterwards when she approached, as if (but of course the interpretation may not be correct) he associated her appearance with the pain he had suffered when he first saw her. Professor Preyer says that "the timidity of young children before small animals can only be explained as the result of inheritance." He noticed this first in the ninth month, "and as late as the thirty-third month the child cried in a ludicrous manner at the approach of a puppy only a week or two old." The timidity, here, is rather anxiety in the presence of the unknown and mysterious than an inherited fear of small animals. I have noticed that an anxious, half-frightened (but also half-curious) look always comes over a child when it sees, hears, or feels anything of a striking nature for the first time.

Professor Preyer points out that blinking the eyes on the sudden approach of an object does not necessarily imply an intensified fear of danger. It seems rather to be a result of experience, not being noticed during the first two months, and is therefore presumably an acquired habit. But he regards the fear of falling when the child begins to walk as instinctive. Here, it seems to me, he is in error. If the fear of falling were instinctive, we should, I imagine, see more trace of such fear in very young children when they are held high in the air, and still more when they are tossed up (as some will unwisely do with their children) to the ceiling. But this is not usually, or indeed generally, the case. I hold my youngest boy high up above the ground, and he only crows with pleasure. I let him down suddenly from that height, and he shows no signs of fear, only a sort of quaint perplexity at the sudden change of position.

So, again, I agree with Mr. Sully in thinking that the timidity displayed by Dr. Preyer's little boy in the twenty-first month, when the child was taken close to the sea, is an inherited fear. As Mr. Sully well remarks: "Much of children's early shrinking is undoubtedly due to a kind of shock which is given by certain things. One may easily suppose that the vast expanse of water, especially when attended by movement and the peculiar voluminous sound, would produce such an effect; and it is certain that something of children's fear of animals, especially of dogs, is

occasioned by shock. A boy of mine showed very decided and strong fear," proceeds Mr. Sully, "amounting to childish terror, at dogs, after one of these animals, which had secretly entered the room with his mistress and ensconced himself under the table, suddenly ran out towards the child, barking. 'Bow-wow' remained for months after the type of everything new and disconcerting. When hearing a strange sound he would run to his mother and hide his face, exclaiming 'Bow-wow!' He showed a dislike to worms, which he also called 'bow-wow.' I think that there is no doubt that inheritance played a part here, but something must be allowed for the mere disturbance of the shock. The fact that a child may be completely upset by the father or mother donning a slight disguise seems to me to point conclusively to this. Dr. Preyer's facts on this head are interesting, but hardly full enough. There is no reference to the seemingly whimsical timidities of children towards strangers. My observations have convinced me that there are certain peculiarities of face and tone of voice which at once rouse strong fears in the child; and M. Perez and others have pointed out that young children shrink from persons dressed in black. Would Dr. Preyer say that these are cases of an inherited association?"

MOVEMENTS IN THE STAR DEPTHS.

AMONG the many contrasts between the seeming and the real presented by the teachings of astronomy, there is not one more surprising than the contrast which exists between the seeming fixity of the stars and the tremendous velocities with which in reality every star is urging its way through space. For what evidence could be more convincing, it would seem, than that which the study of the heavens has afforded in support of the theory that the stars are fixed? Thousands of years ago the constellations are as they now are; Orion with its belt, the seven stars of the plough, Cassiopeia's chair, the garland of stars in Perseus, the Pleiades and Hyades, all the principal star groups were figured by ancient astronomers as we should figure them now. Where else can we find such stability? And if, in thousands of years, the star groups have not changed in form, how can we reconcile the evidence of fixity with the assertions of astronomers that all the stars are in rapid motion, and some certainly moving so swiftly that no form of motion known to us on earth is comparable with these tremendous velocities?

The answer to these questions is exceedingly simple. Indeed, the whole subject of the stellar research depends on very simple conditions; for the magnificence of the problems involved prevents the astronomer from dealing with any but those more striking features which can be considered without the use of complex or recondite methods.

The fact is, then, simply this, that the stars are so far off that their motions, though inconceivably swift, produce no change of place which ordinary observation can recognise. The effects of motion are reduced by distance, precisely as the dimensions of an object are reduced. As a ship on the horizon, though she may be urging her way swiftly through the water, yet seems at rest, so the distant stars seem unchanging in position, though in reality they travel many miles in every second of time.

It is indeed worthy of notice that the effect of the enormous distances of the stars in diminishing their apparent motion is the exact counterpart of the effect of the same distances in preventing any appreciable stellar displacements on account of the annual motion of the earth in her wide orbit. These two circumstances correspond in every respect. We read with astonishment in our own books of astronomy that, though the earth's orbit has a span of 185,000,000 of miles, yet even the nearest star is seen in apparently the same direction (so far as any but the most delicate instrumental observation is concerned) from opposite sides of this enormous path. But we should observe that it follows as a direct inference that if a star travelled as many millions of miles athwart the line of vision it would seem to be unchanged in position, even though that star were the nearest in the heavens.

So that we perceive at once how little reason there is for inferring from the seeming stability of the star groups that the stars are at rest. The great marvel of all is that the groups remain unchanged in appearance during the year, though the earth shifts so enormously in position. That fact is the true basis of all our ideas respecting the vastness of the stellar measure, and once this vastness is recognised the wonder rather is that any stars should seem to move at all than that close telescopic scrutiny is required to detect stellar movements.

If astronomers could only apply the same process for recognising stellar motions which they have to apply to examine the distances of the stars, we should know very little about the movements of the stars. It is not commonly known how little has been really done by astronomers to determine star distances. There are not four stars in the whole heavens whose distances have been satisfactorily determined; and there are not twelve which, under the most rigid scrutiny, have given even the slightest signs of having a measurable distance. All the host of heaven, save these few, all the thousands of stars seen on the darkest and clearest night, all the millions revealed by the telescope, and all the millions on millions of them which no telescope yet made by man can reveal, lie at immeasurable distances. And yet the measuring line which has been used is of inconceivable length. A single length of it brings us to the nearest star, Alpha Centauri, more than 200,000 times further away than the sun; another length added brings us to two other stars, one lying in the Swan and another in the Great Bear; and astronomers know pretty certainly that from three to ten or twelve lengths of this enormous line would give a distance within which lie all the twelve nearest stars. But they have no means of pushing their measuring rod further out into space. Not only can they not do so now, but it is unlikely that any improvements in telescopic construction will enable them to do so at any time.

But the stars whose motions have been recognised are not some ten or twelve, but are counted by thousands, and there is every reason to believe that astronomy will one day count them by tens of thousands.

The reason of this difference between the mastery which astronomers have obtained over one problem while its sister problem remains almost untouched is easily presented.

To determine the distance of a star the astronomer must determine a difference in the star's direction, which is repeated oscillatingly year after year. If we imagine a line drawn from the star to the earth, the earth end of the line would travel round and round in a circle 185,000,000 of miles in diameter, the line itself swaying like a gigantic pendulum, and the effect to the observer on earth would be precisely as though the star were travelling round and round in a circle 185,000,000 of miles in diameter, a line from the earth to the star swaying like a gigantic pendulum. It is the sway of that pendulum that the astronomer has to measure, and how small that sway is will be understood when I mention that in the case of the nearest star it corresponds to the motion of the minute hand of a clock or watch in the 200th part of a second.

But in the case of a star travelling onward with enor-

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mous velocity through space, it is not an oscillating but a continuous motion that has to be determined. In a year this motion may be less (and curiously very much less) than the annual swaying motion of the nearest star. But in the course of many years it becomes measurable or even (in the astronomical sense) considerable. We speak of the astronomical sense, meaning the way in which an astronomer considers displacements, which to ordinary observation are altogether inappreciable. With the telescope, magnifying such displacements several hundredfold, and also supplying the most delicate means of testing displacement, a change of place equal to the hundredth part of the moon's seeming diameter, instead of being barely discernible (as it certainly would be to the unaided vision) is a phenomenon altogether obvious and startling.

Even so, however, by far the greater number of the stars move so slowly on the heavens that the lifetime of a single observer would be insufficient for an exact determination of a star's rate of (apparent) motion. There are some few stars indeed which are moving with abnormal rapidity; and these could have their rates determined in twenty or thirty years with great accuracy. Yet even among these the amount of change in an ordinary lifetime seems surprising small. For instance, the star which moves most rapidly of all—not a bright and conspicuous star as might be supposed, but a star so faint that it has not been thought worth while to give it a name in ordinary star lists—moves in sixty years over a distance less than one-fourth of the moon's apparent diameter. So that if an observer twenty years old noted the place of this star, and in his eightieth year observed it again, it would be that seemingly insignificant arc which he would have to measure—not to *recognise* such and such a displacement, but to *measure* its amount with accuracy.

Of the real rates of stellar travelling we can form no exact ideas, simply because the stars' distances are unknown. There is a method by which the rates of stellar approach and recession can theoretically be determined; but as yet it has not been applied with anything like exactness.

It appears probable that the average rate of stellar travel is about twenty miles per second, a wonderful velocity if we consider that each star is a sun like our own, and that, like the rest, our sun, with his family of planets, is travelling with kindred velocity through space.

Gossip.

By RICHARD A. PROCTOR.

I WRITE my Gossip for this month "by Susquehanna's side," at Wilkes-Barre, Pennsylvania, and in a hotel called "The Wyoming Centre." As I write, a wretched steam-whistle is sounding out the signal demanded by law when steamers on a river sight each other; but otherwise, as the shades of evening close over the scene, it is easy to conceive that in the days of the imaginary "Gertrude" the valley of the Susquehanna looked much as it appears before me now, save for a very modern and business-like bridge just within sight on the right.

* * *

THE story is a touching one as Campbell tells it. It is a slight matter that Wyoming is never pronounced Wy'oming, as the rhythm requires in the line

On Susquehanna's side fair Wyoming;

but always Wyōming. Unhappily, there is a much more serious detail in which reality and the Gertrude story are at issue. Campbell remarks, and might with fair reason have remarked, had he ever visited the Wyoming Valley, that "though the wild flower on the crumbled wall" and "ruined homes a sad remembrance bring" (so nearly as my memory serves me) "of what thy gentle people did befal, yet thou," meaning Wyoming, "wert once the loveliest land of all." It rather destroys the charm of the legend to learn, as is well known here "by Susquehanna's side," that of the three hundred and more who went forth to attack the Indians on that sad occasion, barely thirty were sober—all the sober ones, by the way, escaping with their lives. The descendants of the old settlers are a little sore when the real inwardness of the old Wyoming story is mentioned, though many of them must of course be descended from the sober thirty.

* * *

A CORRESPONDENT sends me a cutting from the *Spectator*, in which a certain explosive is described which can produce its full effects without any heavy substance like cannon, mortars, or the like, from which it need be discharged. From a paper tubing it would be as effective as from a twenty-ton gun. Hence certain direful effects are anticipated for nations like the Swiss, who have hitherto owed their safety solely to the difficulty of conveying artillery into their mountain fastnesses. My correspondent asks whether such an explosive and such singularly "light" artillery are possibilities. They will become so when "action and reaction" cease to be equal and opposite; that is, *never*.

* * *

ANOTHER correspondent asks me whether I consider the influence of the moon on the weather worth the attention given to it in a recent number of *Longman's Magazine*. Since I consider the influence of the moon on the weather as nearly as possible *nil*, it should hardly be necessary for me to say that I do not. Regarded as superstitions belonging to the old time when the moon shared with the sun and planets very potent influence over man, the fancies about the moon's weather significance are quaint and amusing enough. But it would be a waste of time to consider whether after all there may not be some meaning in them, since, without a single exception, they bear the clearest traces of their unscientific origin.

* * *

THERE is one lunar fancy only which has (though its inventors knew nothing of this) a quasi-scientific interpretation. I refer to the notion that if the old moon is seen very distinctly in the new moon's arms wet weather will probably follow. As I pointed out many years ago, illumination of the moon by the earth, when, the moon being "new," the earth is "full" to her, must be to some degree greater when the earth's sunward face is cloud-covered—and as that face lies west of the observer's station when the new moon is seen in the west (the sun having recently set) we have in the brightness of the old moon in the new moon's arms a certain indication of cloudy skies west of the observer, whence usually weather travels. But those who know how persistently the old moon is seen clearly and strongly, even to the time of the moon's first quarter, in countries which have clear skies, while in hazy climes the old moon is seldom seen, must feel well assured that the distinctness of the old moon depends far more on clearness of sky than on any increase in the amount of "earth shine."

* * *

A CORRESPONDENT would like to see that explanation of an ice yacht's travelling faster than the wind, to which reference is made in my article on the curve in base-ball. In one of the first few numbers of KNOWLEDGE such an explanation is given. It may suffice to note here that with a strong beam wind, if an ice yacht travels no faster than

the wind, she is practically sailing 45 degrees or four points from the *effective* wind resulting from the combination of her own speed with the winds. If her speed is increased, she is sailing closer to the effective wind. But an ice yacht, which makes no way, and is little resisted by friction, can sail much closer than four points to the effective wind—in other words, her velocity will continue to increase long after she has attained a velocity equal to the wind's.

Reviews.

Unfinished Worlds. By S. H. PARKES, F.R.A.S., F.L.S. (London: Hodder & Stoughton. 1887.)—It is not, at first sight, very easy to see the *raison d'être* of Mr. Parkes's volume, inasmuch as he simply reproduces (not even always correctly) facts to be found in every modern work on popular astronomy extant. The most apparently obvious motive underlying his work would seem to be that of bolstering up Sir J. W. Dawson's weak and inept attempt to disprove the antiquity of man on the earth. But, having said this, we must in candour add that our author describes the objects of which he treats picturesquely enough, and that the perusal of his book by those approaching the consideration of its subject for the first time will be very likely to implant or stimulate in them a taste for the study of the heavens. We have said that Mr. Parkes is not always correct in his reproductions of astronomical facts, in illustration of which assertion we may quote his dictum on page 31, that it is "not determined whether the stars making up the galactic region are arranged in the form of a ring, with our sun and his planets in the centre," the fact being that it has been incontestably proved that by no possibility can such structure account for observed appearances. He is seemingly familiar with Herschel's first diagram, and knows nothing of what has been done since. Again, we should like to know when—and by whom—the supposition of the variability of Algol was found to be inconsistent with that of the revolution of a large dark planet round it, as stated on page 40. Further, he ought to be aware that the supposed determinations of the axial inclination of Venus to the plane of her orbit are worthless; and, moreover, that a dense atmosphere would keep in the heat like a blanket and not suffer it to radiate into space as he imagines on page 74. And yet again, what in the world does he mean by Mars coming into "*partial* opposition (!) . . . about every two years"? The synodical period of that planet either is, or is not, 779·82 days. He should read up the technical meaning of opposition in any standard work on astronomy. He might as sensibly talk of partial nothingness. Into his teleological argument it is wholly needless that we should follow him; though we may perhaps point out that on page 223, among other places, he muddles up Darwin's theory with Lamarck's. Has he ever opened "The Origin of Species"? Students of celestial physics will be curious to know how and when Dr. Huggins (with Dr. W. A. Miller at his elbow) ever had to ask Dr. Frankland and Mr. Lockyer to corroborate his observations; while astronomers will laugh outright to find the last-named gentleman's name quoted as that of an authority, in company with those of Sir William Thomson (not Thompson, as Mr. Parkes calls him), and Professors Young and Langley, on page 62.

Astronomical Revelations. (London: E. Dexter. 1887.)—It is difficult to enter into the feelings of a man who, knowing nothing whatever of his subject, sets himself calmly to dogmatise upon matters of scientific fact of whose true nature and bearings he is in the most profound ignorance, and who claims to teach that of which he has not himself the most distant glimmering. Of the supernal conceit of the anonymous author of the mass of rubbish whose title heads this notice some idea may be formed from the peroration of his first chapter, in which he has been asserting that the precession of the equinoxes is caused by the trade winds blowing the earth round!!! "And thus," he says, "more than two thousand years after the discovery of the phenomenon by Hipparchus, the true physical cause of the precession of the equinoctial points now, for the first time, stands revealed to the human intellect." Really the idea underlying this explanation (?) is delightful. The gentleman who lifted himself by the waistband of his own trowsers—to employ a current colloquialism—"wasn't in it" with our author. Pending his purchase, and study, of some shilling book on mechanics, we would suggest a simple experiment to him. It is to take a pair of bellows into a sailing boat, and see how fast he can drive her along by their aid. In Chapter II. the secular acceleration of the moon's mean motion is traced to "the earth's rotatory motion round the axis of the ecliptic." In Chapter III. we learn that the diminution of the obliquity of the ecliptic will continue until it and the plane of the equator coincide! Chapter IV. shows that there is no such a thing as aberration; in fact, that Bradley was a mere idiot. It is the deviation of the plumb-line that causes what we call aberration! But *finis coronat opus*, and, just as schoolboys save up a piece of crackling or fat for the last, so has our author reserved his choicest revelation for his concluding chapter. The Herschels—father and son—Mädler, Struve, Proctor, and others have fondly theorised on the constitution and structure of our stellar surroundings, on the assumption that the fixed stars are (practically) infinitely distant suns like our own. Not a bit of it! "The sun, which occupies the centre of our solar system, is the only visible self-luminous body at present existing in the celestial spaces." We are surrounded by a concave sphere of land and water, from the internal surface of which this sun is reflected hundreds and thousands of times (of course only from the water). But, as in the case of the earth, what is now land may in time become water, and *vice versâ*, so that when a fresh bit of the concave becomes watery enough to reflect our sun, a new star appears! We feel that an apology is due to our readers for wasting even the space we have done over such utter, irredeemable trash as this; but (always assuming that the writer of it is responsible for his actions) no denunciation can be too severe of any one of his intellectual calibre who presumes to teach that of which he knows less than nothing. His farrago of nonsense is beautifully printed and bound.

Seven the Sacred Number. By RICHARD SAMUELL. (London: Kegan Paul, Trench, & Co. 1887.)—Reflecting on the shortness of human life, there is something terribly saddening in the thought of the awful waste of time of which the author has been guilty in the compilation of the astonishing mass of puerilities which make up the volume before us. He suffers from what we may call septemania, in the most virulent form. Everything (he fancies)—or nearly everything—in the Bible is septenary in its arrangement or signification, or both; and when it is not, Mr. Samuell insists that it ought to be, and punctuates, redivides, alters, or otherwise juggles with the text in order to make it so. The amount of the most perverse ingenuity he exhibits in his exegetic ramblings is marvellous. He has, moreover, the most supernal contempt for Biblical critics who differ with him, and pooh-poohs poor creatures like Westcott and Hort without mercy when their interpretation of a passage clashes with his own heptadic tomfoolery. Leaving, however, his work in its more purely theological

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aspect to the tender mercies of competent Hebrew scholars, let us turn for a few moments to his chapter on "The Number Seven in Nature." Now, to begin with, he here alleges that there are seven constituent colours in white light, which everyone possessing the merest smattering of science knows to be false. So, again, with our arbitrary arrangement of seven musical tones. But it is when our author arrives at our absolutely artificial systems of classification in the animal, vegetable, and mineral kingdoms that he shines the most. That they are purely conventional and invented to facilitate the study of the objects included in the various categories never seems to have occurred to him; and the way in which he gets seven out of Cuvier's classification is delightful. A page or two further on he is driven to separate the aquatic mammalia (as a class) from the terrestrial ones to eke out one of his "sevens," and, later still, to adopt a kind of table from Mr. Ralph Tate to show that there were seven geological epochs! He is very great, too, in chemistry, and it will, we think, rather astonish Professors Roscoe and Schorlemmer to see how ingeniously details in their classical book are twisted to fit Mr. Samuell's craze. We almost wonder that, in this connection, he did not give the seven bodies in alchemy. What we have said about zoological classification may be repeated, *mutatis mutandis*, with reference to our absolutely artificial arrangement of clouds; while, on cognate principles, he finds seven continents and seven oceans in the globe. The human body bothers him rather more, and here he flounders considerably in his efforts to show indications of some heptadic arrangement. Even the exploded delusion of phrenology has to be invoked to drag in thirty-five primitive faculties and seven rules! Then there are seven races of men, seven sciences (Heaven save the mark!), and we subsequently are treated to some of the arithmetical properties of the number seven. As our author obviously knows nothing whatever of the theory of numbers, he may be surprised to learn that the properties which so astonish him have their origin in our decimal system of notation, and would pertain to another number in, say, a duodecimal one. But we have already devoted very much more space than it deserves to a book which would be merely ridiculous but for the pity we must perforce feel for its author. Wrapped up in an overwhelming sense of his own almost superhuman wisdom and acumen, he is calmly thankful that to him has been revealed, in these latter days, that hidden meaning of the Bible, and, incidentally, of creation generally, which has hitherto been concealed from the best and wisest of mankind. To any one who cares to peruse a perfect example of what we have previously spoken of as the most absolutely perverse literary ingenuity we commend the study of "Seven the Sacred Number." But he ought to be a good-tempered man, of large and charitable views, or he may finish by speaking very disrespectfully indeed even of the author's common sense.

A Treatise on Geometrical Optics. By R. S. HEATH, M.A. D.Sc. (Cambridge University Press. 1887.)—Dr. Heath's volume may be described, with but scant exaggeration indeed, as the very model of what a work on geometrical optics should be. He has availed himself of the researches of Abbé, Gauss, Helmholtz, Listing, and Maxwell, to say nothing of those of Cayley, Lloyd, Rayleigh, and Tait, with the result that he has succeeded in producing a text-book of great excellence. In the case of Gauss's theory of lenses, Dr. Heath works it out by elementary geometrical methods in accordance with the general plan of his work; but subsequently supplements this by Gauss's own beautiful analysis; which we a little fear will have to be skipped by many who will otherwise make good use of the book. The examples appended to each chapter seem remarkably well chosen. The chapters on recent improvements in the microscope, and on meteorological optics, contain much that is at once novel and interesting.

Philip's Planisphere, showing the principal Fixed Stars visible for every Hour in the Year from Lat. 35° South. (London: G. Philip & Son.)—This planisphere is identical in form with that of the Northern Sky, issued by the same publishers, of which we were enabled to speak so favourably on page 21 of our tenth volume, and will be found correspondingly useful by dwellers in South Australia, New Zealand, South Africa, and part of South America.

Elementary Chemistry. By M. M. PATTISON MUIR, M.A., and CHARLES SLATER, M.A., M.B. *Practical Chemistry.* By M. M. PATTISON MUIR, M.A., and DOUGLAS CARNEGIE, B.A. (London: C. J. Clay & Sons; Cambridge: Deighton, Bell, & Co.)—Conscientiously written and brought carefully up to the present stage of our knowledge, the two volumes whose titles head this notice form an admirable and thoroughly trustworthy introduction to the study of chemistry; and the beginner who will read them attentively through and perform the experiments described in the second of them with his own hands will have acquired a sound knowledge of the fundamental principles of the science, and laid a solid foundation for future study. The experiments seem particularly well chosen. We have, of course, made no attempt to check the figures which abound in the book, but, opening "Practical Chemistry" almost at random at page 206, we find the logarithm of 0·3937 given as 9·5951742; the real log. of 0·3937 being 9 (or, strictly, 1) ·5951654.

Moffatt's Deductions from Euclid. (London: Moffatt & Paige.)—These are series of riders, corollaries, &c., to the familiar propositions of the first six books of Euclid, some of them original and others derived from various sources. Their great use lies in the means they afford the student of finding out how far he has understood the various problems and theorems which they illustrate, and for this purpose they seem remarkably well adapted.

An Elementary Treatise on Light and Heat. By Rev. F. WILKINS AVELING, M.A., B.Sc. (London: Relfe Brothers.)—*Elementary Chemistry.* By J. C. BUCKMASTER. Revised and Corrected by C. A. BUCKMASTER, M.A., F.C.S. (London: Moffatt & Paige.)—*A Pupil Teacher's Handbook of Algebra.* By Rev. A. D. CAPEL, M.A. (London: Joseph Hughes. 1887.)—Innumerable additions have been made to our text-books of science since the craze for examination set in, and "the cry is still, They come." Many of the more recent ones have been really too good for merely cramming purposes, and Mr. Aveling's work is among them. Both Mr. Buckmaster's and Mr. Capel's books too at least fulfil the purpose for which they were written.

A Treatise on the Integral Calculus. Part I. By RALPH A. ROBERTS, M.A. (Dublin: Hodges, Figgis, & Co. London: Longmans, Green, & Co. 1887.)—We have a solitary fault to find with Mr. Roberts's valuable addition to our mathematical text-books. It is this: that his own acquaintance with his subject is so intimate and profound that he occasionally loses sight of the fact that the student must, *ex necessitate*, approach its consideration from a different standpoint, or lower level altogether, than he does. But having said this, we have little but praise for his book. His explanation of elliptic integrals is remarkably good, and throughout the work the numerous and well-chosen examples leave nothing to be desired.

The Real History of the Rosicrucians. By ARTHUR EDWARD WAITE. (London: George Redway. 1887.)—We would recommend Mr. Waite's very painstaking volume to all who may be desirous to get to the back of the

Rosicrucian mystery (or imposture). So much nonsense has been talked and written about this imaginary order that it is quite refreshing to find a writer competent and willing to reduce the legend to its true proportions, and show how and when it had its origin. In Mr. Waite's pages we are furnished with the means of estimating the rhapsodies of such writers as Fludd, Vaughan, and Heydon at their true value, and of realising the extent to which such deceivers were themselves deceived. We cannot quite agree with our author that "there is no traceable connection between Masonry and Rosicrucianism," because every mason will at once detect the extent to which the imaginary ceremonial of the supposititious sect was borrowed from masonic ritual. Mr. Waite is justifiably severe on the modern aping of the non-existent mediæval fraternity.

A Professor of Alchemy. By PERCY ROSS. (London: George Redway. 1887.)—In the volume before us, Mr. Ross has told the painful story of Denis Zachaire, an alchymist of the sixteenth century. His weary toil after the secret of the philosopher's stone, and supposed success; his marriage with a nun who had fled from the vice of a convent; her betrayal, by one of the French nobility, to the bloodthirsty scoundrels who, under the title of the Holy Inquisition, so admirably illustrated one phase of the "infallibility" of the Romish Church; her death by poison, and the subsequent murder of Zachaire himself by De Foncé, afford a vivid picture of those bad old times for whose return some perverted intellects yet sigh, happily in vain.

First Lessons in Science. By the Right Rev. J. W. COLENSO, D.D. (Bishop of Natal). (London: William Ridgway. 1887.)—Here is the most delightful and instructive introduction to astronomy for children that we have, so far, ever come across. It appears to have been written twenty-seven years ago, but for the purpose of introducing the young to a knowledge of the system of which our own world forms a member, and of the universe of suns by which it is surrounded, it is as valuable now as on the day in which it was penned. The old solar parallax was, of course, employed by Dr. Colenso, and the editor of this reissue of the bishop's work has left the resulting figures and quantities intact in it. This, however, can interfere but slightly, if at all, with the educational value of the book, which we heartily commend to all who are interested in the introduction of science into our elementary schools.

Studies in Machine Design. By C. F. ARCHER. Series I. and II. (London: Griffith, Farran, Okeden & Welsh.)—These clearly executed examples of mechanical drawing will be found useful alike to the apprentice in the drawing-room and to the fitter at the lathe or bench. The first series consists of six plates of elementary examples, showing how to draw such simple pieces of mechanism as bolts and nuts, pistons, cylinder covers, &c. The second is of a more advanced character, and deals with a launch engine as a whole and in detail. Any tolerably intelligent mechanic ought to be able to read a drawing from a study of Mr. Archer's examples.

The Decorator's Assistant. Second Edition, Revised. (London: Crosby Lockwood & Co. 1887.)—The anonymous compiler of this mass of receipts, &c., has done real service not only to the professional decorator, but to every household whatever. Any one who wishes to make his house beautiful, externally or internally, should purchase this remarkable shilling's-worth straightway. He will find all that he requires, and much more besides, between its two covers.

We regret that space is too limited to permit us to do other than call the attention of our readers to, and urge their support of, Messrs. Smith & Elder's monumental enterprise, the *Dictionary of National Biography*, of which Volume XII. lies before us. There is no slackening of zeal, but rather a quickening of endeavour, in the promise of a yet more rapid issue of a work which is a credit to private enterprise, and as complete as the skill and erudition of Mr. Leslie Stephen can make it. The present volume carries us to "Craigie."

Among the current journals and serials we single out for special notice the *Edinburgh Review*, which gives an admirable and instructive critique of Mr. Lecky's new volumes of his "History of the Eighteenth Century;" *Longman's Magazine*, with its striking and novel account of the "peculiar people" of Salonika, Jews by descent and belief, but outwardly followers of Mahomet; and the *Westminster Review*, with a brief but vivid sketch of Emerson, and an encouraging article on the "Progress of the Masses." As for *St. Nicholas*, it remains far and away the best magazine for boys and girls, but we think the British public is getting weary of the American presidents and generals who have for months monopolised the pages of the *Century Magazine*.

THE FACE OF THE SKY FOR DECEMBER.

BY F.R.A.S.

SHROUDED in the mists which obscure the winter horizon, and destitute of spots for days and even weeks at a time, the sun has ceased for the present to be an object of interest to the observer. He attains his greatest south declination in the early morning of December 22, which is thus "the shortest day." The night sky will be found depicted on map xii. of "The Stars in their Seasons." Minima of Algol (same map) will occur at 11h. 35m. P.M. on the 8th, at 8h. 23m. P.M. on the 11th, at 5h. 12m. P.M. on the 14th, and at 10h. 6m. P.M. on the 31st, as also at other times less convenient for the amateur. Mercury is a morning star throughout December. He attains his greatest western elongation from the sun (20° 32′) on the 5th. He rises some two hours before the sun at the beginning of the month, but is travelling so rapidly southward that his detection towards the end of it is in the last degree doubtful. Venus is a morning star too, and is a most brilliant and conspicuous object in the south-east before sunrise. She is at her greatest elongation west of the sun (46° 47′) on December 2. In the telescope she presents the figure of the moon about the time of her last quarter. Mars and Jupiter are, for the observer's purpose, still invisible. Saturn, however, is now coming into view again, as he rises about eight o'clock in the evening at the beginning of the month, and before 6h. P.M. at the end of it. But little alteration is noticeable in his ring system. He will be found to the west and north of δ Cancri ("The Stars in their Seasons," map iii.) Uranus is invisible; but Neptune may be picked up in the locality indicated in this column last month. The moon enters her last quarter at 3h. 10·8m. in the early morning of the 8th, and is new at 7h. 21·5m. in the evening of the 14th. She enters her first quarter at 7h. 1·2m. A.M. on the 22nd, and is full on the morning of the 30th at 8h. 14·3m. Four occultations only of fixed stars by the moon will occur during December at convenient hours for the amateur observer. On the evening of the 1st she will have occulted 119 Tauri, of the 5½th, and 120 Tauri, of the 6th, magnitude, before she rises; but the reappearance of the first-named star at her dark limb may be seen at 5h. 18m. P.M., at an angle of 248° from her vertex; and that of the second at 5h. 46m. P.M., at an angle from her vertex of 272°. Next, on the 18th, ι Capricorni, a star of the 4½th magnitude, will disappear at her dark limb at 5h. 58m. P.M., at an angle from her vertex of 103°, reappearing at her bright limb 6h. 59m. P.M., at a vertical angle of 350°. Finally, on the 27th, 75 Tauri, a 6th magnitude star, will disappear at the dark limb of the moon at 6h. 26m. P.M., at an angle of 55° from her vertex, and will reappear at her bright limb at 7h. 35m. P.M., at an angle from her vertex of 274°. When these notes open the moon is in Taurus ("The Seasons Pictured," plate xxiii.), through which she is travelling until 2h. 30m. A.M. on the 2nd, at which hour she arrives at the western boundary of the northerly prolongation of Orion. When, by 2 o'clock the same afternoon, she has crossed this, she emerges in Gemini ("The Seasons Pictured," plate xxiv.). Her journey through Gemini occupies her until

10h. A.M. on the 4th, when she enters Cancer. She remains in Cancer until 11h. 30m. P.M. on the 5th, and then passes into Leo. She does not leave Leo for Virgo ("The Seasons Pictured," plate xxv.) until 2 P.M. on the 8th. She is in Virgo until 1h. P.M. on the 11th, and then crosses the boundary into Libra ("The Seasons Pictured," plate xxvi.). As she traverses Libra she, at 6h. 30m. A.M. on the 13th, reaches the western edge of the narrow northern spike of Scorpio, her passage across which she completes by 3 o'clock the same afternoon and comes out into Ophiuchus. She remains in Ophiuchus until 4h. A.M. on the 15th at which hour she quits it for Sagittarius. She is travelling through Sagittarius until 10h. A.M. on the 17th, when she enters Capricornus ("The Seasons Pictured," plate xxi.). She passes from Capricornus into Aquarius at 10h. A.M. on the 19th, and at 5h. P.M. on the 21st leaves the last-named constellation and enters Pisces ("The Seasons Pictured," plate xxii.). As she traverses Pisces she touches the boundary between it and Cetus, and passes into the last-named constellation at 11h. A.M. on the 22nd. At 6 P.M. on the 23rd she emerges into Pisces, only, however, to re-enter Cetus at 5h. P.M. on the 24th. When she finally leaves Cetus, at 7h. A.M. on the 25th, it is to pass into Aries ("The Seasons Pictured," plate xxiii.). 30 minutes after noon on the 26th she quits Aries for Taurus. Travelling, as at the beginning of the month, through Taurus, she reaches the western edge of the northernmost part of Orion, at 9h. 30m. A.M., on the 29th. She takes until 9 o'clock the same evening to traverse this, and then, as before, emerges in Gemini ("The Seasons Pictured," plate xxiv.). She is crossing Gemini until 4 P.M. on the 31st, at which hour she enters Cancer. She is, of course, in Cancer when our notes terminate.

Our Whist Column.

BY "FIVE OF CLUBS."

MATHEWS ON WHIST.

RUFFING AND FORCING.

NEVER ruff an uncertain card if strong in trumps, or omit doing so if weak. The last rule is one of the few universal maxims in whist, and cannot be too rigidly adhered to. It is right even when you know the best card of the suit is in your partner's hand. It has the double advantage of making a useless trump and telling your partner the state of your hand, so that he will play accordingly.

[Ruffing has this further advantage, that if your partner has the best card guarded, he remains with command over the suit—presumably the adversary's: this may be a decisive advantage later on. I suppose Mathews would scarcely insist on the ruff if partner is known to have the best card single. There are cases, however, where even in this position it is best to ruff. The trump card may be absolutely useless, and so nothing be lost, while it may be of critical importance to let partner know your weakness. Usually, however, in such a case the proper course would be to discard from a suit in which you may have a chance of getting a ruff more profitably. The former part of the above rule is by no means so constant a maxim as the latter. Thus with six trumps it is usually well to ruff an uncertain card and go on with trumps. Even with five trumps it is often well to ruff, not following, however, with a trump lead. There are positions, though they are seen but seldom, when it is well to ruff from strength though your partner holds the winning card (guarded), merely that he may be left with command of the enemy's suit. Still, as a general rule, with strength in trumps, a doubtful card should not be ruffed. In the next paragraph (not the next, in his book, however, by any means) Mathews discusses this matter keenly and justly, being especially careful to consider cases where the general rules, on which he properly insists, must be set aside.]

With a strong hand in trumps, particularly if you have a long suit, avoid ruffing your right-hand adversary as much as possible. As this is a maxim less understood, less followed, and more indispensably necessary than almost any other, I will endeavour to explain it to beginners as clearly as I can.

If cards are nearly equal, the point to which the manœuvres of all good whist-players tend is, on the one hand, to establish a long suit, preserving the last trump to bring that suit into play; and, on the other hand, to frustrate the same play of the adversaries. With an honour, or even a ten, and three other trumps, you have a right—if only you manage your trumps well—to expect success. In this case, if your right-hand adversary trumps a suit of which you are void, do not over-trump, but throw away a losing card; by this, since only twelve trumps remain, your own hand is strengthened, while whatever suit is led your partner has the tenace;* whereas, had you over-ruffed you would have given up the whole game to secure one trick. [For you remain with only three small trumps out of eleven left, and the tenace in your long suit remains with the enemy.]

There are cases, however, in which you break through this rule, viz.:—

First, if your left-hand adversary has shown a decided great hand in trumps—in which case make your tricks while you can.

Secondly, if your partner evidently meant to force you. To understand whether this is the case or not, note whether your partner played the winning card or a losing card of the suit of which you are void: if he played the winning card, it is by no means clear he meant to force you, and you should play your own game. If he played a losing card [knowing you to be void in the suit], you are to suppose him [if he understands the game] to be strong in trumps, and may depend on that strength of his to protect your long suit.

Due reflection on the case last considered will show you the value of the maxim which enjoins that you should never play a strong game with a weak hand, or *vice versâ*. [Mathews means that reflection on the inferences you draw from your partner's lead, in the case considered, shows you the importance of always suggesting correct inferences yourself, when in a similar case you have to lead; and thus Mathews enforces the general rule that your leads should always be such as to convey correct ideas as to your strength or weakness.] A few deviations from this effectually destroy the confidence which is necessary between partners: a confusion results which cannot but have the most disastrous consequences. Inattention to this rule cannot be too carefully avoided or too strenuously deprecated.

If strong in trumps, with the commanding card of the adversaries' suit and small ones, force your partner, if he has none of that suit, with the small ones, reserving the commanding card to the last.

It is a general maxim not to force your partner, unless strong in trumps yourself. There are, however, many exceptions to this rule, as—

First. If your partner has led from a single card. [In this case you force him to make the best of a bad business.]

Secondly. If the ruff saves or wins a particular point.

Thirdly. If great strength in trumps is declared against you.

Fourthly. If you have the chance of a "saw."

Fifthly. If your partner has been forced and did not follow with a trump lead.

Sixthly. It is often right in playing for the odd trick.

As regards forcing the enemy,—

Always force the strong, seldom the weak, never both adversaries. In this third case, you play your adversaries' game, and give the one an opportunity to make his small trumps while the other throws away his losing cards. Careless forcing is a very general as well as fatal error; the extent of the mischief is seldom comprehended by unskilful players, who, seeing the good effect of judicious forces, practise them indiscriminately, to their almost constant disadvantage.

The following case, showing the effect of a force, is too obvious not to be instantly comprehended: but the student should note that the same principle operates through the fifty-two cards, however various their combinations; and that its steady consideration [or rather its thorough mastery] is one of the most necessary steps towards an insight into the game:—

A has a seizieme major in trumps, a quart major in one plain suit, and a tierce major in another suit; and his adversary (either on the right or left) has six small trumps and the entire command of the fourth suit. In this case, one force on A gives B the odd trick; without such a force B loses every trick. Though so great an effect may seldom be produced, still there is scarcely a rubber where the truth of the general principle involved is not experimentally proved.

It is easy soon to discover the different strengths of [hands held by] good players, but more difficult with bad ones. When an adversary refuses to trump, and throws away a small card, you conclude [if he is a good player] that his hand consists of a strong suit in trumps, with one strong and another weaker suit. If he discards an honour, you know he has two suits only, one of which is trumps; in this case win tricks when you can. Avoid leading trumps when an adversary has thus declared trump strength, or to his plain suit force him, and give your partner an opportunity to trump if

* Mathews uses the word "tenace" in its proper sense, as signifying "the advantage" of position. There is no connection whatever, as many mistakenly imagine, between the cards ten and ace and the tenace. The word is French, and indicates the "hold" which a player has in particular positions.

possible. This line of play cannot be too maturely considered. A fault constantly committed by bad players, and among those most fatal in their consequences, is to lead trumps in defiance of common-sense, the moment an adversary refuses to ruff—though a winning card; they thus not unfrequently give away five or six tricks, which a judicious force would have saved.

Do not ruff a thirteenth card second hand if strong; but always if weak in trumps. If strong in trumps do not ruff the second best of any suit your partner leads, but throw away a losing card unless you have an established saw.

(*To be continued.*)

A correspondent sends the following whist problem:—

THE HANDS.

B { C. (*trumps*).—A, K, Q, 3. S.—A, Q. / D.—A, Q, 7, 6, 4, 3. H.—2. }

Y { C. (*tps*).—Kn, 10, 9. / D.—K, 9. / S.—9, 8, 7, 5, 4, 2. / H.—8, 4. }

B / Y Z / *Tr.* Clubs / A leads.

Z { C. (*tps*).—8, 6, 5. / D.—Kn, 10, 8. / S.—K, 6. / H.—10, 9, 7, 6, 5. }

A { C. (*trumps*).—7, 4, 2. S.—Kn, 10, 3. / D.—5, 2. H.—A, K, Q, Kn, 3. }

Clubs trumps—A to play and win all the (thirteen) tricks.

In all such problems, where one hand of the losing side seems to hold every suit guarded, as Z does here, the method of attack must be by forcing discards. I have not time to play out the hands (being, at the moment, very busily engaged on a lecture tour, with much literary work on hand), but I have no doubt the following line, if played, will win. A leads spades, B wins the trick and leads out his four trumps, then, according to Z's discard, B and A win the remaining tricks between them. Observe, that if Z's discard be the spade king, then A must presently discard the spade queen, so that B may make two spade tricks. If Z discards either heart or diamond, the rest of the solution is simplicity itself.

Our Chess Column.

BY "MEPHISTO."

MATCH, BLACKBURNE *v.* GUNSBERG.

GAME V.—(KING'S GAMBIT DECLINED.)

WHITE. Gunsberg.	BLACK. Blackburne.	WHITE. Gunsberg.	BLACK. Blackburne.
1. P to K4	P to K4	23. Kt to Kt3	R × RP
2. P to KB4	B to B4	24. R × R	Q × P (ch)
3. Kt to QB3	P to Q3	25. K to K2 (*i*)	Q × R
4. Kt to B3	Kt to KB3	26. Kt to R5	Q to Bsq
5. B to B4	Kt to B3	27. Kt × R (*j*) (1h. 43m.)	Q × Kt (1h. 21m.)
6. P to Q3	P to QR3 (*a*)	28. Q × Q	K × Q
7. P to B5	Kt to QR4	29. P × P	P × P
8. P to QR3 (*b*)	Kt × B	30. Kt to Q2	P to Kt5
9. P × Kt (21m.)	Q to K2 (33m.)	31. R to QKt3	B to R3 (ch)
10. B to Kt5	P to QB3	32. K to B3	B to K2
11. R to KBsq (*c*)	P to QKt4	33. R to Ktsq	B to B5 (*k*)
12. P × P	RP × P	34. Kt × B	P × Kt
13. P to QKt4 (*d*)	B to Kt3	35. P to B3 (*l*)	P × P
14. Q to Q3	Castles (*e*)	36. R to QBsq (1h. 54m.)	B to Kt5 (1h. 34m)
15. P to KKt4	B to Qsq	37. P to R4 (*m*)	P to R4
16. KR to Ktsq	Q to B2	38. P to Kt5	B to K2
17. B × Kt	P × B (*f*)	39. R × P	P × P
18. Q to Q2 (53m.)	K to Rsq (58m)	40. P × P	B × P
19. Q to R6	KR to Ktsq	41. R × P	B to B5
20. R to Kt3	Q to K2 (1h.)	42. R to B7	K to B3
21. R to R3	R to Kt2	43. R to Kt7 (2h. 5m.)	K × P (1h. 55m.)
22. Kt to K2 (*g*) (1h.)	P to Q4 (*h*) (1h. 18m.)	Drawn game.	

NOTES.

(*a*) This is done to prevent the exchange of B for Kt and the threatening of B to K Kt5.

(*b*) The object of this move, which we imagine comes too late, is to prevent B to Kt5 after Kt × B.

(*c*) To provide against P to K Kt3.

(*d*) Necessary to prevent the break-up of the position by P to Kt5.

(*e*) Premature; B to Q2, because of his subsequent troubles, would have been much better.

(*f*) P × P is a blunder, which ought to have lost the game. B × P is much superior.

(*g*) With the object of reaching R5.

(*h*) Black evidently calculated upon sacrificing QR, but, as will be seen afterwards, this desperate remedy should be of no avail against best play. If Black had continued Q to Bsq the game might have proceeded—23. Kt to Kt3, Q to Ktsq; 24. P to Kt5, P × P; 25. Kt to R5, P to Kt5; 26. R to Kt3, &c.

(*i*) White here misses the win; Kt to Q2 was the winning move, for Black could not play Q × R on account of White's reply Q × Rch, K × R, Kt to R5 ch regaining Q with a rook ahead.

(*j*) Although from the appearance of the position it would seem at first glance that White could have done better, yet on closer examination it will be found that any other line of play would not have been favourable for White. If, for example, White played 27. P to Kt5, P × KP, and White cannot play 28. P × BP on account of R to Kt7ch.

(*k*) P to R4 would have been stronger.

(*l*) This move ensures the draw.

(*m*) White's object, having sacrificed the pawn, is to gain both pawns on QB file by playing up his King, but he seeks to provide against P to R4 first.

GAME VII.—(FALKBEER COUNTRE GAMBIT.)

WHITE. Gunsberg.	BLACK. Blackburne.	WHITE. Gunsberg.	BLACK. Blackburne.
1. P to K4	Pt to K4	22. QR to R4 (52m.)	P to QR3 (1h. 5m.)
2. P to KB4	P to Q4	23. Kt × P (53m.)	B × Kt (1h. 12m.)
3. P × P	P to K5 (*a*)	24. R × B (53m.)	K to B2 (1h. 12m.)
4. B to Kt5 (ch) (3m.)	P to B3 (1m.)	25. P to KKt3 (57m.)	R to QKtsq (1h. 14m.)
5. P × P (4m.)	Kt × P (*b*) (3m.)	26. KR to R2 (59m.)	QR to Kt2 (1h. 14m.)
6. P to Q4 (5m.)	Q to R4 (ch) (*c*) (4m.)	27. R × P (1h. 1m.)	Kt to K2 (1h. 15m.)
7. Kt to B3 (5m.)	B to QKt5 (5m.)	28. QR to R6 (1h. 1m.)	R × P (ch) (1h. 15m.)
8. B to Q2 (*d*) (8m.)	Kt to B3 (15m.)	29. R × R (1h. 3m)	R × R (ch) (1h. 15m.)
9. B × Kt (ch) (15m.)	P × B (15m.)	30. K to Q3 (1h. 3m.)	Kt to Bsq (1h. 16m.)
10. P to QR3 (15m.)	P to K6 (*e*) (24m.)	31. P to B5 (1h. 4m.)	Kt to K2 (1h. 16m.)
11. P × B (21m.)	P × B (ch) (24m.)	32. R to Q6 (1h. 6m.)	Kt to Bsq (1h. 21m.)
12. K × P (22m.)	Q × P (26m.)	33. R to Q8 (1h. 7m.)	Kt to K2 (1h. 22m.)
13. Q to K2 ch (*f*) (29m.)	K to Bsq (*g*) (42m.)	34. P to Q5 (1h. 1m.)	R to Kt4 (1h. 25m.)
14. Q to K5 (38m.)	Kt to Kt5 (*h*) (45m.)	35. K to B4 (1h. 8m.)	R to Kt7 (1h. 25m.)
15. R to R4 (*i*) (38m.)	Kt × Q (*j*) (55m.)	36. Kt to B3 (1h. 8m.)	R × P (1h. 27m.)
16. R × Q (*k*) (38m.)	Kt to Kt3 (57m.)	37. P to B6 (1h. 8m.)	P to Kt4 (1h. 35m.)
17. KKt to K2 (40m.)	P to KB4 (58m.)	38. P to B7 (1h. 9m.)	P × P (1h. 35m)
18. Kt to R4 (42m.)	B to R3 (59m.)	39. P × P (1h. 10m.)	R to KKt7 (1h. 40m.)
19. P to B4 (45m.)	R to Ksq (1h.)	40. P to Q6 (1h. 10m.)	Resigns. (1h. 40m.)
20. Kt to B5 (45m.)	B to Bsq (1h.)		
21. R to Rsq (46m.)	R to K2 (1h. 1m.)		

NOTES.

(*a*) An unsound defence; P × P is preferable.

(*b*) P × P is the usual move.

(*c*) This and the following moves assist White in the development of his game; Black ought rather to have played Kt to B3.

(*d*) Best.

(*e*) This move promises a strong attack; as the sequel shows, it is of no avail.

(*f*) Much superior to K to Bsq.

(*g*) Difficult to choose. B to K3 loses the B, although Black would have gained a strong attack; if K to Qsq.; White plays as in the text; if Q to K2, then R to Ksq.

(*h*) A tempting move. There was nothing else.

(*i*) The correct answer; of course Black cannot take R.

(*j*) Q to Kt2 was slightly better, for if Q to K6 (ch), Q inter-

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poses—Q × Q, K × Q, which is the most favourable continuation Black can hope for; he will now be able to bring his KR into play.

(*k*) There is now scarcely any chance for Black.

GAME X.—(QUEEN'S BISHOP'S OPENING.)

	WHITE. Blackburne.	BLACK. Gunsberg.		WHITE. Blackburne.	BLACK. Gunsberg.
1.	P to Q4	P to Q4	41.	Kt to B5 (2h. 17m.)	P to B6 (1h. 55m.)
2.	B to B4	Kt to KB3	42.	P to Kt5 (2h. 22m.)	B × P (1h. 56m.)
3.	P to K3 (1m.)	P to B4 (4m.)	43.	Kt to Q6 (2h. 24m.)	Q to Q2 (1h. 56m.)
4.	Kt to KB3 (5m.)	P to K3 (6m.)	44.	Kt × B (2h. 25m.)	Q × Kt (1h. 56m.)
5.	P to B3 (*a*) (7m.)	P to QR3 (9m.)	45.	R × P (2h. 25m.)	Q to B5 (*n*) (2h. 16m.)
6.	B to Q3 (10m.)	P to B5 (9m.)	46.	R to KB2 (2h. 36m.)	B to K2 (2h. 20m.)
7.	B to B2 (10m.)	P to QKt4 (10m.)	47.	R to B7 (*o*) (2h. 44m.)	B to Q3 (2h. 25m.)
8.	Castles (11m.)	B to Kt2 (10m.)	48.	R to R6 (2h. 45m.)	K to B3 (2h. 27m.)
9.	QKt to Q2 (14m.)	QKt to Q2 (11m.)	49.	QR to B6 (2h. 51m.)	Q to B4 (2h. 27m.)
10.	R to Ksq (18m.)	Kt to R4 (12m.)	50.	K to R2 (2h. 54m.)	K to Q2 (*p*) (2h. 34m.)
11.	B to KKt3 (*b*) (25m.)	Kt × B (12m.)	51.	R to R7 (ch) (2h. 54m.)	K to Ksq (2h. 36m.)
12.	RP × Kt (25m.)	P to B4 (*c*) (13m.)	52.	R to K6 (ch) (2h. 55m.)	B to K2 (2h. 39m.)
13.	Kt to Bsq (*d*) (31m.)	P to KR4 (*e*) (19m.)	53.	R to QR6 (2h. 55m.)	K to Q2 (2h. 42m.)
14.	QKt to R2 (34m.)	B to Q3 (20m.)	54.	R to Rsq (2h. 58m.)	P to B7 (2h. 45m.)
15.	K to Bsq (38m.)	P to Kt4 (21m.)	55.	R to Bsq (3h.)	Q to B6 (2h. 45m.)
16.	K to K2 (38m.)	P to KKt5 (24m.)	56.	R to R5 (3h. 10m.)	K to K3 (2h. 48m.)
17.	Kt to R4 (*f*) (41m.)	Q to Kt4 (29m.)	57.	R to R6 (ch) (3h. 12m.)	B to B3 (2h. 45m.)
18.	R to Rsq. (45m.)	P to R4 (30m.)	58.	Kt to Q2 (3h. 18m.)	Q × Kt (2h. 49m.)
19.	P to R3 (50m.)	B to R3 (35m.)	59.	R to KBsq (3h. 18m.)	Q to B6 (2h. 49m.)
20.	Kt to Bsq (1h. 5m.)	K to Qsq (39m.)	60.	R to Kt6 (3h. 20m.)	P to B8 (Queens) (*q*) (2h. 49m.)
21.	Kt to Q2 (*g*) (1h. 6m.)	K to B2 (39m.)	61.	QR × B (ch) (3h. 21m.)	Q × R (2h. 52m.)
22.	K to Bsq (1h. 9m.)	Kt to B3 (52m.)	62.	R × Q (ch) (3h. 21m.)	K to Q2 (2h. 52m.)
23.	Q to K2 (1h. 20m.)	Kt to K5 (56m.)	63.	R to Q6 (ch) (3h. 27m.)	K to B2 (2h. 53m.)
24.	B × Kt (1h. 24m.)	BP × B (56m.)	64.	R to Q7 (ch) (3h. 32m.)	K to Kt3 (2h. 53m.)
25.	K to Ktsq (1h. 25m.)	KR to KBsq (57m.)	65.	R × P (*r*) (3h. 35m.)	Q × P (2h. 53m.)
26.	QR to KBsq (1h. 26m.)	R to B3 (59m.)	66.	R to Qsq (3h. 38m.)	Q to B4 (2h. 54m.)
27.	Q to Qsq (1h. 33m.)	QR to KBsq (1h.)	67.	R to Ksq (3h. 45m.)	Q to R4 (ch) (2h. 55m.)
28.	Q to K2 (1h 36m.)	P to K4 (*h*) (1h. 10m.)	68.	K to Ktsq (3h. 40m.)	Q to KB4 (2h. 56m.)
29.	Q to Ksq (1h. 44m.)	R to K3 (*i*) (1h. 17m.)	69.	K to R2 (3h. 45m.)	K to B4 (2h. 56m.)
30.	P × P (1h. 53m.)	B × P (1h. 19m.)	70.	R to Qsq (3h. 46m.)	K to B5 (2h. 57m.)
31.	Q to K2 (1h. 54m.)	Q to K2 (1h. 24m.)	71.	K to Ktsq (3h. 49m.)	P to K6 (2h. 59m.)
32.	R to Qsq. (1h. 56m.)	KR to B3 (1h. 26m.)	72.	K to R2 (3h. 50m.)	P to K7 (2h. 59m.)
33.	Kt to Bsq (*j*) (1h. 57m.)	P to Kt5 (*k*) (1h. 30m.)	73.	R to QRsq (3h. 57m.)	K to Q6 (3h.)
34.	RP × P (1h. 58m.)	P × P (1h. 31m.)	74.	R to QBsq (3h. 58m.)	K to Q7 (3h.)
35.	P × P (1h. 58m.)	R × P (*l*) (1h. 58m.)	75.	R to QRsq (3h. 58m.)	Q to R4 (ch) (3h.)
36.	Q × R (1h. 59m.)	R × Q (1h. 35m.)	76.	K Ktsq (3h. 58m.)	P Queens (ch) (3h.)
37.	K × R (1h. 59m.)	Q to B2ch (*m*) (1h. 40m.)	77.	R × Q (3h. 58m.)	Q to B4 (ch) (3h.)
38.	K to Ktsq (2h.)	B × QKtP (1h. 40m.)		Resigns.	
39.	R to Q2 (2h. 5m.)	B to B3 (1h. 46m.)			
40.	R to QR2 (2h. 10m.)	K to Kt3 (1h. 52m.)			

NOTES.

(*a*) Rather slow for the first player.

(*b*) This is not the best; Kt to K5, or B to Kt5 is preferable.

(*c*) To prevent the advance of KP.

(*d*) White in this and the next few moves wastes valuable time.

(*e*) Initiating the attack.

(*f*) This blocks up the knight, but if any other move P to R5 follows.

(*g*) P to B4 was the right move here.

(*h*) The object being to get the KB in a good position, defend the QB, and thus prepare for the advance of QKtP.

(*i*) Threatening P × P, and P to K6.

(*j*) If White played R to KBsq, Black gets a winning advantage by P to Kt5.

(*k*) Better than R × P.

(*l*) Black has attained his object of weakening the White pawns, and may now safely exchange rooks for Queen.

(*m*) Q to B3 (ch) was perhaps preferable.

(*n*) It was very difficult to decide which was the proper move, as White's intention obviously is to bring both rooks into play.

(*o*) If P to B7, followed by P queens, the win is not by any means clearly evident.

(*p*) The ending was exceedingly difficult, as Black was afraid of a draw by stalemate, but he could have played P to B7 instead. White then answers Kt to Q2, P queens, Kt × P, Q(B4) × P, and Black would win.

(*q*) Pr mature; K to B2 was better, as it would have avoided the stalemate position.

(*r*) If R to Q6 (ch), Q interposes; and if R to Kt7 (ch), K to R4, and ultimately reaches R7, and wins.

The *Evening Star* (Dunedin, New Zealand), of September 7, 1887, states that there can be no doubt that Professor LOISETTE'S System of Memory-Training is of great practical utility, and refers to information a Dunedin Student has acquired by the aid of the System in these words:—"Mr. W. B. Eyre has demonstrated to our satisfaction that he can answer any questions correctly on the following subjects—The Kings and Queens of England; the Kings and Presidents of France; the Presidents of America; the names of Shakespeare's plays and the characters in the principal tragedies; the specific gravities of metals; the logarithms of numbers up to 100; when ancient philosophers and modern celebrities flourished; the dates of various inventions; the winners of the English Derby and the Melbourne, Sydney, and Dunedin Cups; the averages made in batting and bowling by the Australian cricketers in England and the English team in Australia; the results of the Otago and Canterbury cricket matches and the Oxford and Cambridge boat-races; the heights of the notable mountains of the world and all New Zealand ones, as well as of monuments and spires; the average height of European soldiers; and the length of the longest rivers in the world, &c. By the aid of the system Mr. Eyre can also repeat backward as well as forward any list of figures which may be read to him, and he also assures us that he recollects poetry and prose with much greater ease than formerly. It is not improbable that he will give a public exhibition of his powers."

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